

chemical constitution of the soil must therefore go hand in hand with minute division to produce fertility.

§ 107. From what has been said, we conclude that a state of minute division of the materials composing soils is necessary to fertility from its greater capability of retaining manures, of absorbing and retaining moisture from the atmosphere, of absorbing heat, and of promoting chemical action; but that too much fine matter, particularly aluminous, hinders fertility by its becoming too compact in the heat of the sun and its diminished absorbent power for water, and generally by the absence of a sufficient variety of the mineral constituents of plants. The following analyses of soils calculated from Sir H. Davy's Agricultural Chemistry, may serve to show the difference in their constitution. The finely divided matter was ascertained by washing the soil with water, and collecting the lighter portion that gradually subsided from the fluid; while the remainder was regarded as sand.

1. A poor heath-sand, destitute of herbage, contained less than 5 per cent. (one-twentieth) of fine matter, and after heating to redness, it consisted of:—

Coarse siliceous sand,	-	-	95
Fine “ “	-	-	2·25
Finely divided matter,	-	-	2·75
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			100·00

The fine matter consisted of ferruginous clay and carbonate of lime.

2. A moderately good sandy soil contained eighth-ninths siliceous sand.

Siliceous sand,	-	-	88·88
Fine matter,	-	-	11·12
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			100·00

The fine matter consisted of

Alumina,	-	-	1·22
Silica,	-	-	1·67
Carbonate of lime,	-	-	7·01
Oxide of iron.	-	-	0·33
Vegetable and saline matter,	-	-	0·56
Moisture,	-	-	0·33
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			11·12

3. A good soil containing five-sixths of fine siliceous sand, or,

Sand,	-	-	83·33
Fine matter,	-	-	16·67
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			100·00

which consisted of:

Alumina,	-	-	-	6.84
Silica,	-	-	-	7.00
Carbonate of lime,	-	-	-	0.67
Oxide of iron,	-	-	-	0.83
Vegetable, animal and saline matter,	-	-	-	1.33
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				16.67

4. A good wheat soil containing three-fifths of sand, or,

Siliceous sand,	-	-	-	60.
Fine matter,	-	-	-	40.
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				100.

which 40 per cent. contained

Alumina,	-	-	-	11.6
Silica,	-	-	-	12.8
Carbonate of lime,	-	-	-	11.2
Animal and vegetable matter and moisture,				4.4
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				40.0

5. A rich soil containing three-fifths fine siliceous sand and 40 per cent. fine matter, which yielded

Alumina,	-	-	-	14.0
Silica,	-	-	-	16.4
Carbonate of lime,	-	-	-	5.6
Oxide of iron,	-	-	-	1.2
Vegetable, animal and saline matter,	-	-	-	2.8
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				40.0

6. A very productive alluvial soil containing one-eighth sand and 87½ per cent. fine matter, which gave by analysis

Alumina,	-	-	-	5.06
Silica,	-	-	-	4.05
Carbonate of lime,	-	-	-	72.92
Oxide of iron,	-	-	-	1.62
Vegetable, animal and saline matter,	-	-	-	3.85
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				87.50

7. An excellent soil for pasture contained one-eleventh of coarse sand, or

Coarse sand,	-	-	-	9.09
Finely divided matter,	-	-	-	90.91
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				100.00

The 90·91 per cent. fine matter consisted of

Alumina,	.	.	.	6·36
Silica,	.	.	.	12·73
Carbonate of lime,	.	.	.	57·27
Oxide of iron,	.	.	.	1·82
Vegetable, animal and saline matter,	.	.	.	12·73
				90·91

§ 108. To apply the principles and the observations laid down, we may remark that the heavy soils of Pencader and other hundreds in New Castle county may be improved by a yellow gravelly sand and loam which is found in abundance in those districts; the clayey soil of the ridge generally by the application of a yellow sand found in quantity in its vicinity throughout the State; the middle section of Kent containing a sandy loam is sufficiently tenacious to yield profitably, and may be best improved by a judicious, not exhausting system of tillage; the light sandy soil of Sussex and the lower part of Kent should be rendered more coherent by the application of yellow clay or even a sandy loam, or where these are not convenient even by light colored clay, and then a course of improvement by proper tillage will amply reward the outlay of capital; the stiff, clayey bottoms of Sussex will be benefitted by applying sand or a sandy loam, which are every where abundant. There are however certain bluish colored clays both in Kent and Sussex, secs. 82, 86, 89, 91, which by exposure to the air become coated with an efflorescence of copperas (recognised by its styptic taste,) in such quantity as to be injurious to land; even these may be employed in default of better provided lime be used at the same time, for the copperas will then be decomposed and the lime converted into plaster. It may be urged that the moderate value of land in the lower part of the State will not warrant such an expenditure. This is undoubtedly true if it were advised to cover a large tract immediately, but it may be done by slow degrees, commencing with a small lot of ground, and if the result be favorable, the system may be gradually extended according to the means of the individual. Nor should it be forgotten that the improvement here recommended will prove more permanent than all others and will be the foundation on which they can rest with the greater certainty; for all are aware that organic manures have an immediate but transient action, whereas a soil of the proper texture may be viewed as permanently fertile, capable of producing more abundantly with the least expenditure.

§ 109. A view of the mineral constituents of plants, as developed by analysis of their ashes will show how varied should be the nature of the substances in soils. The following analyses of ashes are extracted from Berthier's chemistry, and their accuracy may not be questioned.

#### 1. *Ashes of Oak Wood.*

Alcaline Salts.				
Carbonic acid,	.	.	.	28·4

Sulphuric “ . . . . .	5.9
Muriatic “ . . . . .	4.0
Silica, . . . . .	1.0
Potassa, . . . . .	} 60.7
Soda, . . . . .	
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	100.0
Insoluble substances.	
Carbonic acid, . . . . .	30.1
Phosphoric “ . . . . .	7.0
Silica, . . . . .	1.7
Lime, . . . . .	44.7
Magnesia; . . . . .	7.9
Oxide of iron, . . . . .	0.1
“ manganese, . . . . .	2.9
Carbon, &c. . . . .	4.5
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	98.9

### 2. Ashes of Straw.

Sulphate of potassa, . . . . .	0.4
Muriate “ . . . . .	3.2
Carbonate “ . . . . .	trace
Silicate “ . . . . .	13.0
Silica, “ . . . . .	71.5
Carbonate of lime, . . . . .	9.6
Phosphate, “ . . . . .	2.3
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	100.0

The following analysis of a good siliceous sandy soil is taken from the work referred to sec. 107.

Gravel, . . . . .	13.25
Fine sand, . . . . .	53.
Undecomposed vegetable fibre,	3.50
Water of absorption, . . . . .	4.75
Finely divided matter, . . . . .	20.25
Loss of analysis, (chiefly water,)	5.25
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	100.

The 20.25 per cent. of finely divided matter consisted of:

Alumina, - . . . . .	3.25
Silica, - . . . . .	4.25
Carbonate of lime, - . . . . .	4.75
Carbonate of magnesia, - . . . . .	.75
Sulphate of lime (gypsum,) . . . . .	.50
Oxide of iron, - . . . . .	1.25
Matter, chiefly vegetable, (insoluble)	3.75

Soluble matter, chiefly common salt and vegetable extract,	.75
	20.25

There was no potassa apparently found unless a small quantity were contained in the three-quarters of one per cent. of soluble matter, and yet there is no doubt that plants grown in that soil would yield an abundance of that alkali in their ashes, which they must have obtained from the soil. We perceive from the above analysis the difficulty of detecting potassa in small quantity, and from the two former, the necessity or propriety of introducing a larger amount of it into the ground in order to insure more abundant fertility. Now all good farmers are agreed that of mineral manures, ashes is one of the best, whether leached or unleached; and it has been shown above, that it contains potassa and lime in the greatest quantity; even when leached, it still retains no inconsiderable amount of potassa, and a larger quantity of lime, when the latter is employed for running off lye, as is usually the case. What better materials indeed do we need for yielding the fixed constituents of plants, than the same obtained from plants? From the large proportion of lime and potassa in the ashes of plants, and their great fertilising powers when applied to land, we might suppose that a soil should be made replete with them; it is, however, contrary to experience, for an excess will produce equal sterility with a deficiency, and hence the assertion, sec. 103, that silica, alumina, and oxide of iron act as diluents to the other constituents. The muriatic acid is not uncommon in the heavier soils of Delaware, but this acid with the sulphuric and phosphoric are chiefly supplied from organic manures. In conclusion, then, silica and alumina should constitute a very large proportion of the mineral basis of a soil, the former in the state of sand preventing the too adhesive properties of the latter, an effect often produced by oxide of iron, sec. 105; potassa and lime should next follow in their ratios, magnesia in small quantity and the above-mentioned acids also in small proportion. It has been stated, sec. 108, how soils might be improved in texture; and in order to communicate the other constituents, we should employ mineral substances, such as green sand, ashes lime (which generally contains magnesia) &c., and organic manures. Some exception might be made to the necessity of this rule in all cases, and particularly in rocky regions, where the soil often partakes of the nature of the subjacent rock. Thus in the upper hundreds of New Castle county, the detritus of gneiss forms a large proportion of the soil, and introduces substances containing a variety of ingredients, for felspar and mica contain potassa, and while the former is often subject to decomposition, secs. 25, and 157, the latter under peculiar circumstances sec. 157, is also affected, and their separated constituents enter into the soil.

§ 110. But even supposing that a soil is properly constituted, there are methods of increasing fertility to which some attention should be given. The light, drifting sands of the lower part of the State might be advantageously compressed by rolling when wet, and after drying. Nearly all soils, however, are apt to become too compact, and should be render-

ed looser by ploughing, harrowing, &c., the advantages of which are that the rootlets or fine fibres of roots, can ramify with greater freedom and even increase in number, by which a larger proportion of food may be received; that atmospheric air and moisture will be absorbed in greater abundance; that it diffuses the food of plants more uniformly; and that the temperature of the soil may be increased. It is partly with this view that naked fallowing was introduced, but as the utility of this process is at least doubtful, it will not be insisted on. Irrigation is of great utility, not merely in consequence of its supplying moisture, the medium for conveying food, but materials of fertility also, which are usually suspended in water. There is one species of irrigation practised to some extent in Delaware, on the marsh lands bordering on the river, by flooding, or suffering the ingress and egress of the tide on land, which has been embanked, by means of which a large portion of valuable matter suspended in the water is deposited, and gradually raises the surface of the marsh, sec. 101. A system of irrigation might be advantageously adopted on the numberless upland meadows throughout the State, by leading the waters of brooks in channels along the side of the meadows, and suffering it to flow over them through small lateral openings in the channels.

## SECTION II.

### *Organic Manures or those of animal and vegetable origin.*

§ 111. Both animal and vegetable substances in their ordinary mixed state undergo a remarkable change by the influence of air, heat and moisture, giving rise to a process which is called the putrefactive fermentation. That these changes are of a purely chemical nature, governed by the ordinary laws of affinity, experiments have fully demonstrated, but at the same time it is much to be regretted that few chemists have investigated them to the extent they deserve, since their results would undoubtedly prove of the highest utility to the noblest and most useful of all pursuits, the science and practice of agriculture. A rich garden-mould, that is, a soil containing much decomposed organic matter has been found to contain, as the result of organic decomposition, a black or brownish black substance resembling charcoal, to which the name of Hemus-coal is applied, another brown substance with acid properties which is termed the Humic acid, and a third similar to the preceding in appearance, but possessing neither an alkaline nor an acid character, termed Humin. Berzelius applied the terms *geine* and *geic acid* to humin and the humic acid, but he has since laid them aside, giving preference to the names which are adopted in this memoir. By examining the mineral spring of Porla in Sweden, in his usual thorough and accurate manner he discovered the existence of two other substances which he calls the *crenic* and *apocrenic acids* (acids of a spring,) which he has since found to be products of putrefactive fermentation, and to be contained in some quantity in productive soils. These five substances then constitute the amount of our theoretic

knowledge of organic compounds formed in manures of animal and vegetable origin, but a broad and most useful field has been opened for chemical research, on the results of which the use of manures will eventually be based. A concise description of these substances, may not be amiss, as tending to elucidate a very important, but intricate subject.

§ 112. If a rich vegetable soil be extracted with water, we obtain a yellow solution, which by evaporation in a water-bath, leaves a yellow extract. By dissolving in a little water, a large portion remains containing humic acid; but the extract contains also crenic acid. If the earth after being extracted by water be treated with dilute muriatic acid, lime and magnesia with a little alumina and oxide of iron are dissolved, and then alkali takes up a large amount of humic acid, which was combined with those bases in the soil. After the action of alkali, a blackish substance still remains, humus-coal, which is probably the same as humin. Humin appears to exist under two forms, one of which is converted into humic acid by the action of bases, as potassa and lime, the other retains its indifferent properties. Humic acid as it occurs in the earth has neither alkaline nor acid properties, but if it be dissolved in alkali, then precipitated by an acid and washed with water, it becomes aqueous humic acid and possesses decidedly acid properties. It has a sour and astringent taste, and when evaporated to dryness is no longer soluble in water. It forms soluble neutral salts with potassa, soda and ammonia, being readily dissolved by them in a caustic, and sometimes in a carbonated state. With the alkaline earths, it gives powdery compounds, difficultly soluble in water; the humate of lime requiring 2000, that of magnesia 160 parts of water for solution; but after perfect drying they are insoluble. To the greater solubility of the magnesian salt we may attribute the injurious effects of magnesian limestone on soils containing much humic acid. Humate of alumina while moist is soluble in 4200 parts of water, but is very soluble in carbonated alkalis. A solution of proto-sulphate of iron not being precipitated by a humated alkali, it would appear that the protohumate of iron is soluble, while the perhumate requires 2300 of water, but it is dissolved in great quantity by carbonated alkali. Humus-coal, when exposed for a length of time to the air, becomes gradually soluble in alkali, and may then be precipitated as humic acid. It was supposed soon after the discovery of this acid, that it was the cause of fertility, for where a rich soil had been exhausted by excessive tillage, it was found to have lost humic acid in proportion to its exhaustion. This view is corroborated by experiments on the growth of plants, but since the discovery of the crenic acids, it is not to be regarded as the sole cause of fertilisation. Now the humin does not enter plants as such, but in the state of humic acid; and from the preceding we perceive that bases convert the former into the latter. Hence one of the advantages of ashing and liming lands, by which humic acid is formed, which in a more or less soluble state combined with those bases gains entrance into the rootlets and thus promotes fertility. To the action of protoxide of iron, may in part be attributed the utility of green sand as a fertiliser, and even alumina and peroxide of iron may act in a similar manner, although their salts are but partially soluble in water. But the greater part of these salts are rendered very soluble by

carbonated alcalies, and to this circumstance, we may in part attribute the advantages of potash and of stable-manure, which contains carbonate of ammonia.

§ 113. The detection of crenic acid in the spring of Porla, led Berzelius to look for it in the deposits of chalybeate waters, in ochres and bog-ores, from which it may be obtained by boiling with caustic potassa, until they appear like ordinary precipitated hydrate of peroxide of iron. By supersaturating the filtered liquid with acetic acid and adding acetate of copper, crenate of copper remains in solution or if thrown down is redissolved, leaving an insoluble residue of apocrenate of copper. The solution treated with carbonate of ammonia to saturate the acetic acid precipitates crenate of copper, which filtered off, mixed with water, and treated with sulphuretted hydrogen, gives insoluble sulphuret of copper. A filter separates the last precipitate with some difficulty, and the yellow solution passing through contains crenic acid. It is not yet pure, and must be evaporated to dryness *in vacuo*, treated with alcohol, which dissolves crenic acid and crenate of magnesia, and this solution also evaporated *in vacuo*. It is dissolved again in water, and treated with acetate of lead until a portion of the precipitate dissolves, leaving a brown residue of apocrenate of lead. The filtered solution is next thrown down by basic acetate of lead, producing insoluble crenate of lead, which mixed with water, and treated by sulphuretted hydrogen and filtered, gives a solution of pure crenic acid. By evaporating the solution to dryness *in vacuo*, we obtain a transparent mass colorless in thin, and pale yellow in thicker layers, but after perfect dryness it is a hard fissured body, opaque, and of a yellow color. This is crenic acid as pure as Berzelius has yet obtained it. According to an analysis of Hermann, it consists of—

	<i>By experiment.</i>		<i>Atoms.</i>		<i>By calculation.</i>
Carbon	- 40.24	- -	7	- -	40.43
Hydrogen	- 7.69	- -	16	- -	7.54
Nitrogen	- 7.50	- -	1	- -	6.69
Oxygen	- 44.57	- -	6	- -	45.34

On which Berzelius remarks that the content of nitrogen appears to be too small.

§ 114. The importance of this acid to chemists, particularly to those who are interested in the application of science to the arts, and the deficiency of some of our chemical works in many of the later discoveries in the science induced the publication of the preceding method for obtaining the pure acid, and will be a sufficient apology for devoting a few moments to its compounds. It is decidedly acid, not only reddening vegetable blue colors, but communicating a sour taste in a solid state or in solution. It combines with silicic acid (flint,) so that alkali cannot wholly decompose the compound. It forms very soluble salts with the alcalies; those of the earths are less so, and with the metallic oxides, its compounds are very difficultly soluble, but by continued washing with water, they dissolve in a greater or less degree. Crenate of lime precipitates from a solution containing another salt, although it is somewhat soluble in pure water; the bicrenate

of lime is very soluble. Crenate of magnesia is more soluble, and its bi-salt still more so. Bicrenate of alumina is soluble, but there is also a neutral crenate of alumina and ammonia perfectly soluble in water. Crenate of protoxide of manganese is partially and the bi-salt perfectly soluble in water. Crenic acid will attack iron with difficulty so far as to form a very soluble bi-salt. Neutral proto-crenate of iron is also soluble, and may be directly obtained by diffusing yellow ochre in water, and passing sulphuretted hydrogen through it, but it is difficult to prevent its passing into a peroxide salt. To apply these observations as far as our limited knowledge of the subject will permit, we observe that crenic acid combines with silica, and it would be interesting to know the extent of its solubility either alone or with such substances as may be met with in soils, as it might unfold the manner in which silica is received into plants. From the degree of solubility of the salts of the alcalies, earths, and the two metallic oxides mentioned, it is evident that this acid may play a more important part in the fertility of soils than the humic acid. Allusion was made, sec. 105, to the greater fertility of yellow clay over white clay soils, and the mechanical causes of the difference pointed out; but the chief reason is of a chemical character, and refers evidently to the content of the crenic acids in the yellow ochrey matter which imparts its characteristic color to the land.

§ 115. If moist crenic acid be exposed to the action of the air, it is converted into the apocrenic. After acidifying the first alkaline solution obtained from the bog-ore, and precipitating by acetate of copper, sec. 113, it was observed that apocrenate of copper remained. The precipitate should be mixed with water, sulphuretted hydrogen passed through it, and the whole filtered. By evaporating the filtered liquid to dryness and treating with warm absolute alcohol, the pure apocrenic acid dissolves. Another portion, however, remains on the filter with the sulphuret of copper, from which it may be extracted by a solution of acetate of potassa; and by evaporating the last to dryness, and treating the residue with alcohol of 0 86, the apocrenate of potassa remains undissolved. It is dissolved in water, and precipitated by muriatic acid. When dry, apocrenic acid is blackish brown, full of fissures and gives a dark red powder; reddens vegetable blues, and has an astringent, but not an acid taste. The salts of apocrenic acid resemble the crenates, sec. 114, excepting that the former are blackish brown, and those of difficult solubility are still more so than the corresponding crenates. According to Hermann this acid contains—

	<i>By experiment.</i>		<i>Atoms.</i>		<i>By calculation.</i>
Carbon	- 62·57	- -	14	- -	62·11
Hydrogen	- 4·50	- -	14	- -	5·07
Nitrogen	- 15·00	- -	3	- -	15·41
Oxygen	- 17·63	- -	3	- -	17·47

The apocrenated alcalies are very soluble; those of the earths, as lime, are blackish precipitates, which by continualedulcoration gradually dissolve with a yellow color, but if the bases be in excess they are in-

soluble. It has so strong an affinity for alumina, that if hydrate of alumina be digested with apocrenate of potassa in solution, the whole of the acid is precipitated, and leaves a trace of crenic acid with the potassa, but a portion of the alkali has fallen down, so that an insoluble double salt is formed. Berzelius was unable to separate it from alumina by any process short of decomposition. Protapocrenate of iron is soluble and by exposure to the air forms a basic persalt. There is also a basic protapocrenate, which becomes brown in the air, and closely resembles the ochre deposited from the Porla spring. Although it is an exceedingly difficult matter to solve complex questions on the action of organic manures in the present imperfect state of our knowledge relative to these acids, yet on the assumption strengthened by observation that they play an important part in the vegetable economy, we are enabled to explain the mode of certain operations in agriculture. Thus, for example, if a soil contains an excess of earthy bases in comparison with the amount of organic matter, insoluble basic salts with the organic acids will result, constituting a soil of diminished fertility. The large quantity of manure requisite to render a clayey soil productive may be explained by the well-grounded supposition that much of the organic matter is rendered temporarily inert by its difficultly soluble combination with alumina and other earthy bases, while the very slow and gradual solution of its salts explains in part the fact that such soils yield for a greater length of time.

§ 116. The valuable series of experiments conducted by Berzelius did not terminate with the examination of these acids as obtained from the spring of Porla or ferruginous ores, for he was led to examine for their presence in putrefied vegetable matter, and as usual with all his operations with useful results. He procured the blackish brown pulverulent residue of an oak stem, which had putrefied in marshy ground, from which by a series of operations similar to those described above, secs. 113, 115 he obtained crenic and apocrenic acids, the latter differing in a few points from the same acid described in sec. 115, and in such a manner as led him to view it rather as a combination of that acid with the humic. He farther examined the action of nitric acid on charcoal and found the greater part of it converted into a yellow substance (not examined,) and two acids which resembled the crenic and apocrenic, but the apocrenic thus obtained differed in its atomic weight and power of saturation from the acid obtained from ochres, or that from putrefied vegetable matter. The experiments therefore, although not giving results perfectly conclusive to the theorist or practical man, offer nevertheless the first insight we have obtained into a series of phenomena of the most complicated nature, but at the same time promising the most useful results. Hænle examined a chalybeate, and found it an organic acid very similar to the crenic, which he called *puteanic acid*, (puteum, a well) and Brandes discovered one in another mineral spring; from all which it would seem as if there were a class or genus of such organic acids, differing more or less from each other and yet possessing certain properties in common, which entitle them to be placed in the same rank.

§ 117. It was shown in sec. 109, how varied the mineral contents of a soil should be in order to its fertility, but even if these constituents are

mingled together in due proportion, there is one point of the greatest importance, the commixture of organic matter, without which no soil can be productive. If we examine the constituents of wood, we find that Pine contains less than one per cent. of ashes or earthy matter, Birch about one per cent.; Hazel one and a half, Oak branches, two and a half, the remainder (90-99 per cent.) being organic matter. The chief constituents of the organic matter are Carbon, Oxygen and Hydrogen; the minor but not less essential are Nitrogen, Sulphur, Phosphorus, &c., of which a large proportion of the first four may be obtained from water and atmospheric air, but undoubtedly the greater part of all these constituents is derived from organic matter in the soil; for although plants will vegetate simply from the presence of air and moisture, yet their feeble and sickly state compared with those growing luxuriantly in a good soil, under similar circumstances, and other things being equal, fertility being in direct proportion to the amount of organic matter, is abundant evidence of its utility and necessity. Growing plants, particularly when inflorescence commences, take up large quantities of organic matter, and if successive crops be removed from the soil, constantly diminish the amount of such matter so that the earth however fertile, would at length cease to be so. This must therefore be replaced by organic manures, or the residues of animal and vegetable matter, which are gradually converted into humin, and the humic, crenic and apocrenic acids. The experiments of De Saussure on mould seem to prove that by the alternate action of air and moisture, a portion of insoluble humin is changed into soluble humic acid, and that the contact of air with a solution of the latter, reconverts it into humin. Humus-coal, sec. 111, generates a portion of carbonic acid with the oxygen of the air, and then becomes humin and humic acid, and indeed on this principle alone we may account for the utility of naked fallowing or frequently by turning up a soil which contains much humus-coal for it loosens the earth and permits the free entrance of the atmosphere.

§ 118. It is to be regretted that few practical experiments have been instituted since the valuable discoveries of Berzelius relative to the crenic acids, but the following analyses made by Hermann of a very fertile soil, which covers a large portion of southern Russia and Siberia and stretches into Hungary, will serve to show the influence of culture on those acids, and the advantages that must flow from their closer investigation. This mould is ordinarily from one to two feet deep, but sometimes attains a thickness of several fathoms, and may not inaptly be compared to our prairie or bottom-lands of the West. *A* is a soil, which has never been under culture; *B* has been long cultivated but never manured, and *C* from the same locality below the former, from a depth not penetrable by the plough.

	A	B	C	
Sand, - - - - -	51·84	53·38	52·77	
Clay or finely divided matter.	{ Silica, - - - - -	17·80	17·76	18·65
	{ Alumina, - - - - -	8·90	8·40	8·85
	{ Oxide of iron, - - - - -	5·47	5·66	5·33
	{ Lime, - - - - -	0·87	0·93	1·13
	{ Magnesia, - - - - -	0·00	0·77	0·67
Acids, which were combined with oxide of iron and alumina (and other bases?)	{ Water, - - - - -	4·08	3·75	4·04
	{ Phosphoric acid, - - - - -	0·46	0·46	0·46
	{ Crenic " - - - - -	2·12	1·67	2·56
	{ Apocrenic " - - - - -	1·77	2·34	1·87
Humic extract, - - - - -	1·77	0·78	1·87	
Humic extract, - - - - -	3·10	2·20	0·00	
Humic and vegetable fibre, - - - - -	1·66	1·66	1·66	
	99·84	99·76	99·86	

From an examination of the first column, we find that the soil contains  $20\frac{1}{2}$  per cent. organic matter, 4 of water, and  $85\frac{1}{2}$  of earthy material; a comparison of it with the second and third columns shows that the humus extract is produced on the surface, and is probably thrown off by vegetation; a comparison of the second and third proves that by cultivation the humic acid is diminished by more than one per cent. of the whole soil, the crenic seven-eighths, and that the apocrenic has increased by nearly one half per cent.; that, therefore, the crenic and humic acids have partly been converted into the apocrenic, and partly received into the growing plants.

§ 119. It is not uncommon to divide soils into fertile or neutral and acid, a correct distinction, but not according to the ordinary views of the subject, for it is not a rare conclusion that a soil is acid because it grows certain weeds, such as the sheep-sorrel. The truth is, that acid soils are very rare, either producing nothing or at best a little moss, and are only found in marshy ground; and farther, the acid existing in sorrel, is very different from those in an acid soil, and is not taken up by the plant, but actually generated and secreted by it. They have nearly the same composition as ordinary soils, excepting that instead of the humic acid being combined with lime, it is united according to Einhof with acetic and phosphoric acids, and according to V. Pontin with the same and also malic acid. Such soils may be rendered fruitful by the application of lime which neutralises the acids, producing large quantities of humate and the crenate of lime. Ashes will produce a similar result. The acidity of a soil may be conveniently tested by litmus paper or an aqueous infusion of a vegetable blue color, which the smallest quantity of free acid will change to a red.

§ 120. The power of a well comminuted and well proportioned soil to absorb moisture was shown, sec. 104, but in proportion as it contains organic matter, this power is greatly increased, so that a good soil may contain three-fourths of its weight of water without appearing to be wet. It is in fact the mould or humus in it to which it is indebted for this valua-

ble property, for it is one of the most powerful of hygroscopic substances. Such decomposed vegetable matter may absorb double its weight of water and yet appear dry, and even after being dried it will take up in the course of 24 hours 80–100 per cent. of its weight of moisture. Like charcoal it is mainly indebted for this property to its porosity, which it loses when converted into humin, by becoming more dense and solid. From this fact we are enabled to account for the continued moisture of a mouldy soil, even in a drought, for it requires a great amount of heat to expel the greater part of the water. Farther, it has the property in a high degree of absorbing the rays of the sun, and by parting rapidly with its acquired heat in the evening, it condenses the dew more readily, which is therefore in contact with it a greater length of time. It is then evident from what has been said relative to soils in the preceding, secs. 111 to 120, that their fertility depends in a higher degree upon the amount of organic matter they contain than on any other condition, and that it is a matter of some moment in what state of decomposition it is found, for if too large an amount of the organic acids be present, the action on vegetation would be too rapid and transient, whereas, if much humin or humus-coal is contained in a soil, the action will be gradual and commensurate with the increasing wants of the plants.

§ 121. Having shown the theory of the operation of organic manures as far as it has been investigated, we will in the next place notice the various kinds which are or may be employed in agriculture in Delaware. All kinds of vegetable matter constitute manure, but as it is composed of various substances, such as gum, sugar, albumen, gluten, oils, fibre, &c., which are variously subject to decomposition, it is necessary that different kinds of plants or the same plants at different seasons should receive a different treatment prior to their application. All green succulent plants are very liable to fermentation and it becomes a question whether it is necessary to suffer them to ferment above the soil. The rich juices they contain render them liable to a rapid change, and they should, therefore, be immediately applied, which may be performed by ploughing them into a shallow depth, so that fermentation may take place slowly in the soil. Hence the acknowledged utility of turning in grass-land, in which the decay of the vegetable matter during the time it lay in grass, and of that which is freshly turned under, consisting of roots, stems and leaves, affords, by a gradual decomposition, much nutriment to the future crop. Indeed, this principle is now so well understood and generally received, that it is not an unfrequent practice to sow crops with the view of turning them under the surface; and in many parts of Delaware, particularly in the middle and southern portions of the State, this method of improvement cannot be too strongly recommended, for the chief deficiency of those soils lies mainly in organic matter. In order to derive the greatest benefit from growing plants as a manure, they should be ploughed in during inflorescence, as it is believed they then contain the largest amount of nutritive matter. Along the bay-shore and sea-beach are to be found large quantities of sea-weed, soft-reed and other plants, both in a green and dry state, which should unquestionably be applied, perhaps not im-

mediately to the land, but to the barn-yard heaps, which they will increase in quantity without detracting from their value.

§ 122. Dried vegetable matter, such as straw, hay and stubble, whether of weeds or of useful plants, affords abundant nutriment. It has been a constant practice, until within a few years, to ferment vegetable substances thoroughly, under the impression that such a process was necessary before they could become nutritive; of late years, however, the plan generally adopted and most approved of by skilful farmers, has been to suffer them to enter an incipient stage of fermentation. This view was based upon the experimental deductions of Sir H. Davy, and the subject should not be passed over without drawing the attention of farmers to the fact that this important change in the application of manures was first induced by theoretic experiments made in the laboratory, and ought alone, if other proof were wanting, to satisfy them that what is technically termed book-farming is not without its benefits in the practice of agriculture. There is no doubt that fermentation destroys a large portion of nutritive substance, and that in proportion to the extent of decomposition, but at the same time it is also objectionable to plough in long straw, "from the difficulty of burying it, and from its rendering the husbandry foul," but by a partial fermentation, seeds are more or less rendered incapable of germination, and the manure is more manageable, while there is not an important loss of nutritive matter. The chief reason why a partial fermentation should have taken place, lies in the very difficult decomposability of fibre, which constitutes an essential and large portion of dried vegetable matter. Hence also the chief objection to the use of tanner's spent bark, which being divested of its soluble and more decomposable materials, consists principally of fibre. But even this substance may be fermented by the lapse of time, and will then constitute a manure of considerable fertilising power. It has been employed with success in a few instances in Delaware, where the slow fermentation of several years has rendered it soft and perfectly rotten. To hasten its fermentation, stable-manure should be occasionally added to it; but it is not advisable to throw it on the barn-yard heaps, since it would not be sufficiently decomposed when it is required to haul out the latter manure. Saw-dust and wood-shavings may probably be fermented in a shorter time than spent bark, as they still contain soluble matter.

§ 123. Even charcoal has been employed as a fertiliser, and Sir H. Davy proved by direct experiment that it absorbed oxygen from the air and formed carbonic acid, from which he deduced its efficacy. It probably acts beneficially from two other causes: 1. From the great absorption of gaseous matters and water, and 2. From the changes which some of them undergo. We have just seen that carbonic acid is generated by the absorption of oxygen, but nitrogen is also absorbed, and it is not improbable that nitric acid may be generated, particularly where a base is present to receive it. According to experiment the nitrogen is not changed, but then these experiments were conducted in a short space of time, and no account taken of the changes which nature would produce by length of time or the presence of moisture and bases. If nitric acid be formed, we would be at no loss to account for the utility of charcoal, since we

might refer its action to the phenomena examined by Berzelius, sec. 116, in which substances are formed resembling the crenic and apocrenic acids. It would therefore be both interesting and useful to ascertain whether nitric acid can be generated by the absorption of atmospheric air. It is not, however, necessary to resort to its formation in charcoal, for small quantities of this acid are brought down by rain, and it may have in its diluted state by lapse of time, the same action as more concentrated acid would exhibit in a shorter period. Or since carbonic acid is generated, may not charcoal act in a manner similar to humus-coal, and become more easily convertible into humin and humic acid, as was mentioned in sec. 117. The subject is certainly deserving farther investigation, and experiments may be performed by impregnating fresh charcoal with a weak solution of potash, exposing to sun and air or under the soil for a year, and then examining for the presence of saltpetre, to ascertain whether nitric acid is generated, or with and without potash to ascertain whether it has become more easily convertible into humin.

§ 124. All kinds of animal matter constitute a powerful manure, whether excrementitious or not, and being much more subject to decomposition, their fermentation so far from being attempted should be checked. Flesh, fat, hair and feathers, may all be employed with little or no preparation. The common practice of burying a dead animal should be discarded, since it is actually throwing away a quantity of matter possessed of the highest fertilising powers. They should be covered plentifully by soil with a very little lime, suffered to remain some months, and upon removing them mixed with fresh lime to destroy the effluvia; both the animal residue and the superincumbent soil may be applied to land. Fish are employed with great success, both in Britain, on the coast of New England, and on the shores of the Chesapeake, but their effects are so powerful, that it is advisable to mingle them with a poor soil. It is probable that there are places in Delaware where fish could be obtained in sufficient quantity to be employed as manure, and in the event of their application, the following points should be attended to, viz:—to mingle them with poor earth—to apply them quickly to the soil—to turn them under immediately, and at a considerable depth, for if near the surface they would ferment too rapidly, and dissipate much valuable matter. The refuse of the tanning processes, containing much animal matter and lime, ought to be viewed as a very valuable manure, and fortunately there are many such establishments in Delaware, which may avail themselves of this refuse. Horn and bones constitute a superior manure, the value of which in Delaware is not practically known, for heaps of bones may be sometimes seen filling up holes under fence rows, or whitening in a field, that is *thrown out* after having been impoverished by tillage. After the fatty matter has been removed, they consist chiefly of gelatine and phosphate of lime, both of which are useful in promoting fertility. To attain the greatest amount of benefit from them, they should be reduced to the finest powder, and spread lightly over the soil.

§ 125. Excrementitious animal substances form manures of superior quality, which have been employed from the earliest times, and yet the nature of their operation is far from being satisfactorily understood. Urine

having been examined chemically is found to consist of a large number of alkaline and earthy salts, gelatine, albumen, urea, uric acid, lactic acid, &c., in a state of solution, and is very subject to fermentation chiefly in consequence of the presence of albumen and gelatine, which being destroyed by the operation, render it less valuable as a manure. It should therefore be applied immediately to the soil, being previously diluted with water or earth, in consequence of its excessive richness. Containing all the ingredients necessary for the luxuriant growth of vegetables, and these in a state of solution, it is easy to understand its value as a manure. Dung of every kind is a valuable source of fertility, and although universally acknowledged as such, the best method of its application is far from being generally known. That of birds and domestic fowl ranks among the most powerful, but being very subject to fermentation, if it can be obtained in quantity should be immediately employed. The excrements of cattle, horses and sheep, although less subject to fermentation than the preceding, is sufficiently so, to admit of its immediate application with advantage. A better method of employing it is to apply its fermentative qualities to straw, hay and other refuse vegetable matter of a farm, towards which it acts as yeast to flour, causing the whole to ferment.—One of the most powerful manures, easily obtained and in considerable quantity, and yet remarkable enough, one which is frequently if not generally thrown aside in Delaware, is night soil or human excrementitious matter, every particle of which should possess the highest value in the eyes of an agriculturist. It is valuable whether employed in a moist, dry or fermented state, but as with other similar substances, fermentation lessens its value.—As a large amount of animal and vegetable matter collects in process of time on roads and along fence-rows, it should be taken up together with the subjacent soil, and applied to land either alone or mingled with lime.

§ 126. When we have more or less of the above materials in the barn-yard, it is far from being an immaterial point as to the state in which they should be employed. If applied prior to fermentation, a good effect will result although less so than if fermentation had commenced; but if fermentation be carried to its utmost, a very large proportion of nutritious matter is destroyed; but where the proper medium lies, what is that point at which the greatest benefit results, neither practice nor theory have determined with precision. Two experiments of Sir H. Davy are worth introducing here, although they have been often recorded. He filled a retort with hot fermenting dung, and in three days obtained a liquid containing chiefly ammoniacal salts and gaseous matter containing 21 cubic inches of carbonic acid gas. Finding such matter to result which was generally believed to be nutritive, he applied the beak of a retort filled in the same manner to the roots of grass in a garden, and in less than a week, he observed the grass to grow much more luxuriantly than in any other part of the garden. It follows, therefore, that much valuable matter is lost during the process of fermentation; and so conclusive were the arguments deduced from practice and theory, that Sir H. Davy thought it worth the experiment to ascertain whether straw chopped fine would not be a more economical manure than if employed after fermentation; and

yet in another place he observes that "a slight incipient fermentation is undoubtedly of use," in order to decompose woody fibre, which "is always in great excess in the refuse of the farm." The latter observation is the more correct of the two, viz: that fermentation should be commenced in the farm-yard. Independently of numerous practical experiments which prove the superior advantages of only a partial decomposition, the following reasons are conclusive in themselves; fermentation destroys or dissipates in proportion to time and violence, much organic matter, which would have been a source of great fertility to growing plants; it farther occasions a loss of that heat which would be generated by a fermentation in the soil; substances in their nascent state, that is, at the instant of their formation, are much more disposed to enter into new combinations, and hence fermentation in contact with the rootlets of plants will be more likely to excite a more vigorous action; where fermentation has taken place out of the soil, the action of the manure will be more rapid and vigorous for a short time, but where it occurs in the soil, it will be more gradual and salutary in its operation, and the amount of benefit will be greater in the aggregate.

§ 127. Since it is, therefore, a matter of importance that manure should be applied in a partially fermented state, and as it is only applied once or twice during the year, the quantity will necessarily accumulate, and being composed of fermentable materials, we must resort to some method of checking its progressive decomposition. Air, heat and moisture being the active agents in producing the change, they must be excluded or their influence diminished. Watering the dung-hill has been proposed and employed for the purpose of cooling it, but the effect is only temporary, and when the water becomes warmed, the action will be more violent. The contrary course of spreading it out to dry is undoubtedly preferable, nor need we fear that much valuable matter is lost by evaporation, as seems to be apprehended by many agriculturists, for if preserved from moisture, but little danger is to be feared from heat. Covering the heap with a stiff clay is of advantage in keeping off the ready access of air, which is essential to fermentation and may be readily practised in many parts of Delaware. We have, however, more efficient means of obviating the difficulty by resorting to compost or composite nature, which has the additional advantage of increasing the quantity without materially diminishing the intensity of stable manure. As manure is formed and removed to the farm-yard, it should be levelled and not heaped as is usually the case, then covered over by a layer of undecomposed vegetable matter, as straw, hay, weeds, &c., and topped by black soil from marshes, creeks, ponds, &c. The same series may be repeated until the compost has acquired the depth of several feet. The black soil alluded to which abounds in the State, is composed of vegetable matter in various stages of decomposition mingled with variable quantities of earth, but the larger portion of it is peaty and not sufficiently altered to be immediately applied to land in the State in which it is found, so that a partial fermentation adds to its fertilising effects. Hence its application in the way proposed not only improves itself, but prevents the fermenting manure from farther injury by excessive fermentation. To assert that the addition of lime to

manure would check its decomposition might appear to a majority of persons heterodoxical, were it not that there are many facts to show that such is the result. Among other proofs the desiccation of night soil, sec. 125, may be adduced. Being very subject to fermentation, its value would be materially lessened if suffered to remain exposed to the air in a moist condition, and therefore the Chinese mix it with one-third of its weight of fat marl (calcareous,) make it into cakes, and dry them in the sun, in which state it forms an important article of internal commerce. The *poudrette* of the French, and *desiccated night soil* of the English, is a similar article, excepting that it is prepared with quicklime. The fermentation of the night soil in these instances is prevented not merely by the drying nature of the materials with which it is mingled, but chiefly by the chemical action of lime.

§ 128. What has been said above relative to fermenting manures referred more particularly to their solid portions. There is, however, always formed in the dung-hill a liquid, which in many instances is suffered to drain away, as if it were actually detrimental; but who, that has observed the astonishing fertility that marks the course of such a stream from the barn yard, has not been convinced of its fertilising powers? In truth it often contains the richest portions of the manure, where fermentation has been carried to excess, and in every case it should be preserved. This may be conveniently effected by composing the manure with dry materials which will absorb a portion of the liquid, and exercising care in the location of the yard, so that we may have a solid basis impervious to water, such as clay or stone; a floor of the former may be conveniently constructed in any part of the State, and may be so modified, if required, as to conduct the liquid in a shallow cistern, from which it may be removed when wanted, and applied to the garden or other small patch as it is more convenient for this purpose than solid manure. Whatever system be adopted, the method too commonly pursued in Delaware, of suffering the barn-yard to become nearly fluid, or at least, very muddy, cannot be too much deprecated nor too soon abandoned.

§ 129. The subject of organic manures has received in the present section such attention as is not inconsistent with the nature of the memoir, when we consider that the main resources of the State are confined to agriculture, but so far from having exhausted the subject, we may safely say that it is a mere outline containing general views, and descending only to particulars where it is thought to be applicable to the wants of the people. We have shown that the constituents of a fertile soil beside earthy matter, are humus coal, humin and the humic, crenic and apocrenic acids, and that these substances evidently play an important part in vegetation secs. 111-120; that the different kinds of animal and vegetable matter form manures which replace those substances extracted from the soil, secs. 121-125; that animal substances should be directly applied without previous chemical preparation, secs. 124-125, and that vegetable substances should have been partially fermented prior to their application, sec. 126, that therefore the fermentation of the latter should be retarded rather than accelerated, sec. 127; and lastly, sec. 128, that the liquid as well as solid parts of manure are endowed with fertilising powers.—

Although chemists have done much to unravel the intricate nature of organic manures, yet it must be acknowledged that the theory of their application is as little understood as the practice, and until the former is placed upon a more certain foundation the latter cannot make that progress which is so desirable, and which will one day place agriculture on a footing with more exact sciences. We must however be rejoiced to perceive that many of the best chemists of the day are applying their theoretic knowledge to the advancement of the arts, and that organic chemistry is at length receiving its due share of attention.

### SECTION III.

#### *On Calcareous Manure.*

§ 130. Limestone when pure is composed of  $56\frac{1}{4}$  per cent. of lime, and  $43\frac{1}{4}$  of carbonic acid or fixed air. When chalk or powdered limestone is dropped into vinegar, a strong effervescence ensues with the disengagement of the carbonic acid while the lime is dissolved, and hence the use of vinegar or other acids for testing shell marl which is chiefly valued for the carbonate of lime it contains. By heating also, the fixed air is driven off and quick-lime remains, which is the ordinary process by which lime is obtained in a caustic state. If the quick-lime thus obtained be moistened with a certain quantity of water, it soon becomes heated, throws off a portion of the water in the form of steam, and falls to a very fine white powder which is a hydrate of lime, always containing 24 per cent. water; if, however, more water be added, the same hydrate is formed, but the excess of water agglutinates the powder into lumps or masses which will eventually become hard, and resemble stone. Still more water dissolves it, and forms lime-water. If quick-lime be exposed to the air, it also falls to a coarser powder by absorbing it 12 per cent. of water and 24 per cent. of carbonic acid from the air, constituting a mingled carbonate and hydrate of lime. The same change occurs with that which has been slacked by water and is exposed to the air, the carbonic acid of the atmosphere replacing the water of the hydrate. The carbonate of lime such as exist in chalk, limestone, &c., is scarcely soluble in pure water, but if the latter contain carbonic acid, as rain-water usually does when in contact with the soil, the limestone enters into solution. Magnesia combined with carbonic acid is a common ingredient in limestones, and is rendered caustic in the same manner as lime, but as its attraction for that acid is less powerful than that of lime, when the two are mingled together, the latter will become carbonated before the magnesia begins to attract the same acid from the air. What has been said relative to the two earths will be found sufficient to explain their mode of operation, when employed for promoting fertility.

§ 131. The ground from which we start in order to ascertain the effect

of lime is unfortunately but little understood, for few direct and decisive experiments have been made to ascertain its precise effects on animal or vegetable substances. Much has been written and said relative to its preservative and destructive effects on organic manures from which we learn that it operates both ways according to its chemical state. If employed as quicklime, and placed in contact with organic matter, its alkaline properties would lead us to infer a decomposing influence, which is confirmed by experience; but the effect is of short duration, and is succeeded by the reverse operation, that of preserving such matter from further decomposition. The truth is, if we could insure a continuance of its caustic state, we might be equally sure of its constant decomposing power, but by this action, it generates carbonic acid from the organic matter uniting with it and forming a neutral carbonate, which either acts like other salts in preventing decomposition by its *presence* or *catalytic* influence, or being formed and hardened in the interior of the organised material, protects it from further decay. For this reason it was mentioned sec. 127, that it might be used to prevent excessive fermentation in the dung-hill; and to the same properties we may in part ascribe its utility in the soil, viz. that of permitting the slow and gradual decay of organic matter in quantities suited to the demands of vegetation. It has been supposed that the chief value of lime as a manure lay in its caustic or destructive effects, but that this position is untenable is proved by the successful application of marls and even powdered limestone, which are robbed of their caustic properties. Sir H. Davy and others who have written on the subject of agriculture refer the utility of lime to its causticity, and state that "chalk, marl or carbonate of lime will only improve the texture of the soil or its relation to absorption; it acts merely as one of the earthy ingredients." This view is unquestionably incorrect, for it has been known to produce astonishing effects on peaty soils when applied in the form of carbonate and not caustic lime, and powdered limestone as well as marl have been successfully used on ordinary soils. Besides, if "the formation of soluble matter from insoluble organic materials" be the chief effect of lime, this effect should take place immediately while the lime is in its caustic state, but it appears sec. 130, that it soon becomes carbonated in the soil, or by exposure to the air, and yet its useful effects are more perceptible a considerable time after its application, and may be perceived for many years. Whence it appears that its action on organic matter in the soil is continued (probably not increased) in the soil after carbonation.

§ 132. Much of the vagueness in descriptions relative to the use of lime has arisen from an imperfect knowledge of the organic constituents of soils, which have latterly been partially developed, and a description of which has been given secs. 111—119. Authors have divided the organic matter into soluble and insoluble, by the former of which we understand the humic, crenic, and apocrenic acids, and by the latter humin, humus-coal and vegetable fibre; and they state that lime is injurious where there is much soluble matter in the soil as it forms insoluble combinations. The truth is, the humate of lime is partially soluble sec. 112, the crenate somewhat so, and the bi-crenate very soluble, sec. 114. Now by admitting these acids as active ingredients in soils, we are at no loss to account

for the utility of carbonate of lime, for the weak affinity of the carbonic acid is overcome by their superior attraction, and more soluble salts are formed which may then be received into the rootlets of plants. There can be no doubt however that caustic lime is of greater benefit where a soil contains humin and vegetable fibre, as it promotes their incipient decomposition. The utility of lime, therefore, is threefold; first, that of decomposing organic matter, and rendering it a suitable nourishment for plants, sec. 112; secondly, that of combining with organic matter and rendering it capable of being received into the vessels of vegetable organization for promoting vegetation; and lastly, that of lengthening the time of decomposition of organic matter, which, therefore, yields nutrition in proportion to the demands of a plant in the progress of its growth.

§ 133. It has been supposed by many to be necessary that lime should be caustic as it is only then soluble, but it should not be forgotten that the carbonate is also soluble in water containing carbonic acid, sec. 130, and farther, it is not necessary that either the carbonate or quick-lime alone should be dissolved in order to explain its influence in vegetation, for moisture, the medium of chemical action, is always present in the soil, and assists in its soluble combination with the organic acids. There is, however, another action of lime with reference to the soil itself, which is of importance, viz., that it renders clayey lands looser, and sandy soils more tenacious. The latter of these contrary effects is of a chemical character, and there is little doubt that lime acts like mortar by combining the particles of sand together. The former is partly mechanical, the mingling of less cohesive earthy matter with the clay, and partly chemical, in which the lime dissolved by rains is washed into the crevices and cracks of the clay, where, becoming carbonated, it prevents their farther adhesion. To effect these results most powerfully it is evident that the lime should be employed in a caustic or water-slacked state. According to these views, therefore, it is a matter of less moment on what kind of land lime should be spread as it tends to ameliorate its condition or texture, and is the medium of conveyance of nutrition to vegetable life.

§ 134. It was stated, sec. 130, that magnesia usually enters into the composition of lime, and sec. 39, that a part of that in Jeanes' quarry contains nearly one half of carbonate of magnesia. In fact nearly all the limestone employed in Delaware, for spreading on the soil is magnesian, and it is therefore worth investigating how far the magnesia may be injurious. One of the first limestones employed for this purpose in Pennsylvania, from which lime derived much of its reputation as a manure in this section of country, and which has not lost its character to the present time is nearly of the same composition with Jeanes' stone; a very fair proof that such a content of magnesia is not injurious under certain circumstances. Sir H. Davy's view of the subject appears to be correct, that magnesia in a caustic state is injurious, but that when carbonated it is beneficial. It was stated § 130, that it remains caustic for a long time exposed to the air, and particularly when mingled with lime; therefore, in employing a magnesian limestone if there is little vegetable matter in the soil it will be apt to injure the crops, but this effect may be obviated by

mingling it with fermenting manure which will rapidly carbonate it. There is another view of the subject which has never been broached, viz: the influence of the organic acids in the soil. If much humic acid be present it will form humate of magnesia soluble in 160 parts of water, while humate of lime requires 2000, § 112, so that it will be taken up in greater quantity than lime. But by referring to the quantity required by plants as shown by an analysis of their ashes, we find § 109, that oak requires about  $5\frac{1}{2}$  times as much lime as magnesia, and that ashes of straw yield nearly 12 per cent. of carbonate and phosphate of lime and no magnesia, from which it would seem that the latter is injurious to plants from its excess where humic acid is abundant. But if the soil contain much humin, and other insoluble organic matter, its action in a caustic state would be beneficial like that of lime, § 132. We have, therefore, in Delaware abundant means of rendering magnesian lime useful, by employing it in conjunction with peaty matter, the black soil of marshes, creeks, &c.

§ 135. To point out the advantages of the use of lime on the soil would be useless as it is too generally acknowledged; nor is it necessary to enter upon a discussion whether it may be viewed in the light of a nutritive substance itself, for it is undoubtedly as necessary to vegetable as to animal life, and probably plays the same part by assisting in the formation of the skeleton or bony part of vegetables. It will be more advantageous to consider what preparation it should undergo prior to its application. What is the object we have in view in its application? It is to obtain it in the finest possible powder, so that it may be diffused more equally in the soil, and may present the greatest amount of surface to the organic matter on which it is destined to act. It is a general law, and one without exception, that the more finely divided a substance is, the more rapid and intense will be its chemical action; in other words, the action will be energetic in proportion to the surface exposed. Now it must be evident that if a solid mass of lime be laid on or in the soil, its effects will be trifling, since its surface is small; and if it be broken into two parts, we have not only the original surface of the whole mass, but the additional fractured surfaces, and by pursuing our division into very small pieces, that is, to powder, the increase of surface is almost beyond calculation. The chief object in slacking lime, is to obtain this extended surface. It would be most injudicious to pour an indefinite quantity of water upon quicklime for the reason stated sec. 130, that to form a hydrate an exact quantity is required amounting to 24 per cent. But as there is usually a large proportion of magnesia present which takes up a little more water, more than one-fourth as much water as there is lime should be added to convert the whole into a hydrate. And since the heat developed by the slacking process evaporates a large amount of moisture, still more water should be added so that for a good quality of stone, about one-third as much water as there is lime may be safely employed to convert it into finely powdered slacked lime. Where the lime is known to be of inferior quality, less water will be required, and indeed it is always advisable to add too little, since more may be used to supply the deficit which shows itself after slacking. If too small a quantity be employed,

the whole of the lime will not fall to a fine powder, and this state may be recognised by its grittiness and coarseness; if too much sec. 130, the powder which is formed adheres together forming a more or less pasty mass. In either case the value of the lime is lessened, but while the former deficiency may be remedied as pointed out above, the latter can only be obviated by recommending it to the kiln. The more common fault in the use of lime is adding too much water, and it is practised to such an extent that one-half if not two-thirds of the lime employed in agriculture is lost to all good effects in the soil. So important is this point, that it would be worth the expense to every farmer to slack his lime under cover, lest the addition of an excess of water from rain might diminish its value. There appears to be a want of union among agriculturists on the question whether it is better to employ it water or air-slacked; but it appears that the air unaccompanied by rain does not bring it to as fine a powder as water alone, and if the rain is permitted to fall on it, we may have an excess of water, since we cannot regulate the quantity; so that under all circumstances it appears to be more advisable to slack it artificially with water alone.

§ 136. The quantity of lime which should be applied to land varies very much with the nature of the soil, and no precise rules on this head can be given. The practice in this section of Pennsylvania, is to apply from 30 to 80 bushels per acre to light soils, and from 100 to 300 bushels to clayey lands, but in England they consider 150 as a good dressing for lighter and as high as 500 have been spread on an acre of heavier lands. Two chief reasons why so little definite is known on the subject are, that sufficient attention has not been given to slacking lime with the proper quantity of water, and that the quantity and nature of the organic matter in the soil has been too much neglected. It might seem incredible to assert that often not more than one-fifth of that which is applied proves serviceable, and yet from the ordinary careless mode of slacking it, the proportion lies within the truth. The lighter soils of Sussex and Kent, containing but small amounts of organic matter, would be as much benefitted by 20 bushels in fine powder, spread evenly over the surface as by 60, as ordinarily employed. In the same manner 100 of fine lime on heavy soils would produce as striking results as 2 or 300 of a half pulverised lime. One point cannot be too strongly insisted on under all circumstances, that of never turning in lime too deep, or otherwise by its sinking much of it becomes valueless.

§ 137. Much diversity of opinion exists relative to the time when lime should be spread. The season is probably of less importance, excepting where much undecomposed matter exists in the soil, in which case lime in its caustic state should be applied during the summer season, when the heat will promote chemical action. Much has been said and written on its application to different crops, and every mode found successful by some individuals because they can scarcely fail in deriving benefit sooner or later; the more preferable method seems to be to spread it on a fresh grass or clover sod and suffer it to lie quietly upon the surface, until the sod is turned under, which should not be done to a great depth. If a green crop alone be ploughed under, its decomposition will probably be too rapid,

and all or nearly all the gaseous matter will escape, whereas by the action of caustic lime, a more rapid decomposition ensues, until in a short time the carbonic acid thus generated being absorbed by the lime, farther decomposition is rendered more gradual. By spreading lime as here advised on the sod, and permitting it to remain, a portion of it will be dissolved by water while in the caustic state, and diffused through the soil, and when the residue is fully carbonated, the rain becoming charged with carbonic acid on the surface of the land, becomes capable of taking it up in small quantities and carries it to the rootlets of the plants. A more luxuriant vegetation should therefore occur, which is indeed agreeable to observation; and hence, when the sod is ploughed up, the remaining lime (which is possibly nine-tenths of that employed) is brought to act in a slow and salutary manner on the decomposing organic matter with the production of humate and crenate of lime. It is thought inadvisable by good farmers to put it on the heap of stable manure, and the reason given for this advice is, that it renders nutritious matter insoluble. That the difficultly soluble humate of lime would be formed cannot be doubted, particularly where it is employed in a caustic state, but it is not improbable that if a light layer of slacked lime were applied, which had been exposed for some time to the air, it would prove advantageous by decreasing the fermentation. It seems as if they had been alarmed by this formation of insoluble compounds, whereas they are in truth partially soluble, and to this slow solubility we must partly attribute the value of lime; and besides, the same compounds will be formed when organic manure and lime are separately spread over the same soil. Where there is a mass of unfermented organic matter, the application of freshly slacked lime will be decidedly beneficial by promoting its incipient decomposition.

§ 138. Beside the lime obtained from the Schuylkill and Jeanes' Quarry, there is one other source which has not received its due share of attention, and which applies more particularly to the lower section of the State, where some other kinds of manure are not very accessible. It is to be found in numberless shell-beds of various dimensions, scattered along the shores of the bay from the middle of Kent to the lower part of Sussex. There are both natural and artificial deposites, and although many of them are strictly subjects of geological inquiry, they were omitted in Pt. II., because of their want of continuity and extent; but the two kinds may now be noticed together with reference to their application to agriculture. Some of them, as that mentioned sec. 81, are too deeply covered to be made available, but generally speaking they lie upon the surface in beds of from six inches to two feet in thickness, imbedded in a dark and even black soil; they consist chiefly of the common species of oyster which now inhabit the bay and creeks, and are in various stages of decomposition, usually crumbling to fine scales with a slight force, but sometimes as hard as fresh shells. There are a few small beds, evidently the production of the Indians, in Little Creek and Jones' necks, but between Jones' river and Murderkill, they are not only more numerous but far more extensive. On the land of G. Emerson in Little creek, a small bed varying from six inches to two feet in thickness, and situated on the banks of a small stream, is evidently an Indian deposite, for the shells

are imbedded in the same clay which constitutes the subsoil. On Jones' neck there is another deposit on a farm belonging to Messrs. Sipple and Pennewill, where the shells are imbedded in a black soil precisely similar to that of the adjoining marsh, but very unlike the yellow clayey subsoil. The bed appears to pass into the marsh and indeed from all circumstances connected with it, it seems to have been a natural deposit. Many similar deposits exist on small branches of Murderkill, but the quantity of shells in them is small when compared with those both natural and artificial, which literally cover the point of land between the mouths of Jones' and Murderkill.

§ 139. On Mispillion neck, and indeed on both sides of the creek, the quantity of shells would entitle them to the appellation of a good calcareous marl, were the beds continuous, but even as they are now situated they may be advantageously employed. On Slaughter and Prime-hook necks these deposits appear to be chiefly of Indian origin, but on Broadkill neck, they are both natural and artificial, and as far as the wants of the neighborhood are concerned, there is sufficient to supply the demand. Although there are such deposits between Broadkill and Lewestown, they are neither numerous nor extensive; below Lewes, however, they again increase in quantity. One of the latter on marsh land belonging to H. F. Hall, is decidedly a natural deposit, the shells belonging to various species of oyster, clam, &c., being so broken and comminuted that scarcely a whole specimen is to be found. Another about three miles S. of Lewes on a high bank is an unusually extensive Indian deposit, the utility of which has been attested, although applied to the land in the same unbroken state in which it is found.—The marly deposit near Dagsborough, and the two in Baltimore hundred, sec. 91, are of a different character from those under description, and evidently lay claim to a much greater antiquity; there are, however, others in Baltimore hundred, of the same nature as those above described of artificial and natural origin, which should not be neglected by the citizens of that section of country.—The western border of the State crosses the rivers and creeks too far inland to admit of the examination of similar deposits within the State; it is known, however, that there are extensive beds of ancient and very modern shells, of which advantage may be taken by those residing in the western part of Delaware.

§ 140. The sources of shell lime for manure in Delaware may be arranged under four groups. 1. Those from which the oyster has been latterly procured for food, large quantities of which are brought from the bay and creeks, and the trifling importance attached to them is proved by the facts, that in a majority of instances they are thrown aside, or when sold, it is at the price of two or three cents per bushel. This source presents the advantage of continuance.—2. Shells drifted on the beach in layers of six inches to two feet, and sometimes nearly free from gravel and sand. They are chiefly the thin-shelled oyster, inhabiting the creeks, from which they are carried out during storm-tides, and driven on the open beach. A deposit of considerable extent existed in 1838, on Thorn Point, S. side of Mispillion, and small mounds of the same of a more ancient date were visible in many places on the marsh lands. 3. Deposites

on the marshes, coast, creeks and their branches, usually imbedded in a black marshy soil, which extends into the adjoining water or cripple. On Bowers' beach at the mouth of Murderkill, they extend below high, and some below low water mark, and are united into a compact mass by a black clayey soil and sea-weeds. Exposed to the action of air only on the surface, and probably not for a great length of time, they are less decomposed and friable than those further inland. From all the circumstances connected with them, they appear to have been natural shell-beds, the accumulation of a long period of time, which have been undisturbed since their formation, and have been elevated with the general level of the land until many of them are now above high-water mark. 4. Deposites on the banks of creeks, inlets, &c. They differ from the preceding in being contained in an earth similar to the subsoil, for although it may be sometimes black, yet it is decidedly different from the marshy soil which encloses the third group. That they are Indian deposites is shown from their situation on the dry banks of streams navigable at least for canoes, from the accompanying earth which is not marshy; from the nature and size of the shells, which are such as can be used for food; and from the occasional presence of Indian works of art.

§ 141. These various scattered deposites taken in the aggregate contain in all probability a sufficient amount of lime to supply the neighborhood in which they occur for all purposes for which they may be required, and we ought to avail ourselves of every means, however small, of enriching land from its own productions, whether presented by nature or by art. Two methods may be followed to prepare shells for application to the soil, the first of which, to burn them, is ordinarily adopted. The usual mode of burning is sufficient for making a good lime, unless wood has been sparingly used; it consists in erecting a hollow square pile of logs which is filled up by alternate layers of wood and shells, and the whole mass fired. In consequence of the too frequent want of fuel a large proportion of the shells falls into scales by slacking, instead of forming a fine powder, a defect which may easily be remedied by the plentiful use of wood. The process of burning should only be applied to the first and second groups, but even in such a case, how much valuable animal matter is destroyed, which if it could be obtained would render the shells far more efficient as a manure! Whoever has watched the burning of shells, must have observed that they soon become dark and even black, continuing the same color for some time. This arises from the combustion of animal matter, and proves what quantity is present. In order to obviate this loss, the geologist during his tour through the State, has advised the crushing or grinding the shells to powder, from whatever source they may be derived, for although such a process might seem too laborious and expensive at first view, yet it may be shown that it may be done in a very simple and convenient manner without the outlay of much capital. An ordinary horse bark-mill may be employed for grinding the hardest fresh shells, although the operation is imperfectly conducted on a wooden floor, but it may be used with impunity for shells of the second and third groups. The best form of construction would be to arrange an old worn out mill-stone like the stone of a bark mill, and to make a floor of rammed clay

and shells, or better of brick or stone by which arrangement from one to 500 bushels might be ground to a fine powder in a day. Passing them between two cast iron cylinders would undoubtedly be a preferable arrangement, for speed and perfect crushing; but the advantages would scarcely be justified by the expense attending it. The fresh shells of groups one and two, would undoubtedly tend more to fertilise the soil than if reduced to powder by burning, in consequence of the superior fertilising power of animal over mineral matter; much more would those of the third and fourth groupes prove beneficial if used in the same manner, for the black or dark soil in which the latter are imbedded contains a large amount of both animal and vegetable matter, the whole of which together with that in the shells would be destroyed by burning. They should, therefore, together with the accompanying soil be ground as fine as possible, and without any other preparation be applied to the soil. Even where they have in a few instances been drawn out from their beds and scattered over the land in their unbroken state, increased fertility has been the result; and if applied in the manner proposed, they deserve to be viewed as a fertilising source of the first order.

#### SECTION IV.

##### *Green Sand.*

§ 142. The average composition of the green sand was stated, sec. 79, and the experience of nearly half a century in New Jersey and of a few years in Delaware having proved its efficacy in imparting fertility to the soil, we may now inquire in what manner it operates. The quantity of lime contained in the pure varieties being usually very small, and having treated of this substance at some length in the preceding section, we may neglect it altogether and regard the other constituents. When it is decomposed by the ordinary processes of the laboratory, only a small quantity of silica and all the other constituents being dissolved, we may regard the oxide of iron, potassa and alumina as performing the principal functions, assisted by the presence of water. The useful action of potash or of ashes in the soil has been long acknowledged, and hence, as soon as it was known that the green sand contained potassa, its utility was immediately referred to that alkali; latterly, however, the opinion has gained ground that the protoxide of iron plays an important part by acting with the organic matter in the soil, in a manner resembling the saponification of oil by potash. This view is correct as far as it goes, but it can scarcely be deemed admissible to make such a practical generalisation as to call all decomposed organic matter in the soil geine, in the present more advanced condition of the subject, when we know that humic acid (geic acid) is formed from humus (insoluble geine,) and that two other acids, the crenic and apocrenic, are also constituents of soils, as well as of organic manures. The iron in the green sand being in the state of protoxide, amount-

ing to upwards of 20 per cent., and the potassa averaging 7 per cent., both strong bases, we can readily explain their mode of action by assisting in the formation of humic acid at least, sec. 112, and it is highly probable that farther experiments will show a similar generation of the crenic acids. It is also farther probable that where these bases are present, their catalytic influence causes the atmosphere to convert humus into the organic acids with greater rapidity. The humic and crenic acids being present combine with such free bases and even decompose their feeble compounds, forming salts of different solubilities, the protohumate and crenate of iron being very soluble but rapidly convertible into per-salts, the salts with potassa being very soluble and those of alumina and lime difficultly soluble, secs. 112 and 114. The addition of much unleached ashes to a soil determines the formation of salts of potassa, which being very soluble are taken up in excess by growing plants, and produce such luxuriant vegetation as to cause it, technically speaking, to *burn up*. The same operation would probably occur with protoxide of iron were its salts not soon converted into more insoluble humate and crenate of the peroxide. We may further suppose that the protocrenate of iron is received into the vessels of organisation, a portion of the crenic acid yielded up as food, and a basic perapocrenate secreted and ejected by the rootlets of the plants. To the difficult solubility of the humate and crenate of lime may in some measure be referred the utility of that earth, and therefore if we suppose the frequent formation of soluble super-salts, as is sometimes done, they would tend to induce excessive luxuriance, sec. 132.

§ 143. It might be objected by many that green sand being decomposed with difficulty by the powerful acids of the laboratory, there is little probability that it can be resolved into its constituents by the feeble action of humic or atmospheric agents. Independently however of the proof of its decomposition by its inducing increased fertility, and of the mode by which nature, operating with feeble agents during a lengthened period of time, produces great results, it may be shown that it is more readily decomposed than is generally admitted. Wm. M. Uhler, in conjunction with the author of this memoir, has lately been engaged in making a series of experiments on this subject, which, although incomplete, nevertheless afford sufficient grounds for drawing a few conclusions. Dilute acetic acid decomposed green sand after the lapse of a week or more; oxalic acid produced the same result in a few days and in the course of two weeks nearly all the green sand had disappeared and the yellow oxalate of iron precipitated. But the most surprising effects were produced by the action of carbonic acid, one of the feeblest known to the chemist, the use of which for this purpose was first proposed by Mr. Charles Roberts, of Philadelphia. By a well charged solution of this acid a large portion of the sand was decomposed in a few days and a weak solution induced the same effects in the course of a few weeks. Although few experiments were made to determine quantitatively the relative amounts of the constituents taken up by the acids, yet the qualitative tests were sufficient to show that all the ingredients were separated from each other and that the green sand might be analysed even by the feeble operation of carbonic acid. At the time of publishing the present memoir, experi-

ments are being instituted to determine approximatively the effects of the crenic and humic acids on green sand, but from their known power, no doubts can remain relative to their efficacy in promoting its decomposition. If this series of investigations be carried out not only with the above acids in a separate, but also in a combined state, as in organic manures and rich vegetable mould, they may prove of considerable value to agriculture, in developing the mode of operation practised by nature in her extensive laboratory.

§ 144. As the present state of our knowledge of these subjects is limited when compared with that advanced stage which we firmly believe chemistry will produce in process of time, it would be presumption to make unhesitating assertions relative to the *modus operandi* of organic and inorganic manures; we may nevertheless, and indeed we ought to draw such inferences as is consistent with our present knowledge of facts. The potassa of the green sand appears to act on organic matter in the soil by catalysis forming soluble salts of potassa; the protoxide of iron acts in a similar manner, but is itself changed to a less soluble compound; and the alumina probably has a similar action proportional to its feeble affinity. To the question that, since potassa acts in this manner, why does not a large quantity of green sand produce excessive luxuriance? it may be answered, that it does where the quantity is very large, but that its action is modified and extenuated by the difficulty with which the marl is decomposed and by the presence of other bases beside potassa. When green sand is decomposed by nature or in the laboratory a small quantity of silica is taken up, and even this substance by forming a salt with crenic acid, sec. 114, may assist in increasing fertility, as it is an essential constituent of plants. The action of lime and magnesia has already been noticed. There are two points touching the theory of the operation of green sand, which remain to be noticed, the first of which is that when its decomposition has commenced it advances in an increasing ratio; and the second, that the constituents of green sand in their nascent state, that is, at the moment of their disengagement from the compound, act with much greater energy. Thus it would appear then that all the constituents of the marl exercise an influence in promoting vegetation, and this action must take place in proportion to their respective affinities, potassa being the most powerful, followed by lime, magnesia, protoxide of iron, alumina and silica; that the four first assist in the generation of organic acids, with which they and a small portion of alumina and silica combine to form salts of different degrees, but generally of difficult solubility, which nourish and invigorate nascent vegetation; that by the presence of a large portion of bases which will form salts of difficult solubility a more prolonged and healthy action is insured.

§ 145. The above remarks relative to the mode of operation of marl apply equally to the several varieties, sec. 18, as far as relates to the content of green grains, but the calcareous species owe their action partly to lime in proportion as its carbonate exists in the marl. When phosphate of iron occurs in quantity, sec. 72, some notice must be taken of its probable influence, for in regard to it, we can only reason from theory, since it has never been applied directly to land with the view of ascer-

taining its effects on vegetation. It appears from the analyses of Berthier, that both phosphate of lime and of iron exist in appreciable quantity in the ashes of plants, for in the composition of oak ashes, given § 109, he divides the 7 per cent. of phosphoric acid between lime and iron in such a manner as to form nearly 14 per cent. of phosphate of lime and one-fifth per cent. of phosphate of iron, and in other cases he gives the amount of the salt of iron as high as 9 per cent.; and we believe from experience that the utility of bone manure is largely due to its phosphate of lime; and hence we may infer that the marl alluded to may be serviceable or even very valuable from its phosphate of iron, and that if it were mingled with a little lime, where it is wanting in the marl, the atmospheric and *humic* agents, if the expression be allowed, will cause such a transmutation of the constituents as to bring both phosphates to exert their influence in advancing the growth of plants. But it would appear unnecessary to add lime in the present instance, as there is already a small quantity in the marl, § 72, were it not that there is still another substance mentioned as occurring chiefly in the marl of the dividing ridge and deep cut, § 73 to § 78. This substance, the sulphuret of iron, is not, it is true, observed in the pits mentioned, § 72, but its presence is shown by the large amount of white efflorescence with which it becomes coated after exposure to the air, precisely similar to those pits where it is observed in pieces of considerable size. After the marl described in § 74 has been exposed to the air for a short time, a whitish efflorescence forms on its surface, which has a strong styptic taste and is the sulphate of iron, formed from the sulphuret, but in the pits alluded to above, § 72, the snow white efflorescence is chiefly sulphate of lime or plaster. Now the latter marl contains lime, and the former does not, and hence this operation of nature in the formation of plaster from sulphuret of iron points out to us the manner of attaining the same result, viz: by mixing with marl, which exhibits an efflorescence after exposure to the air, a quantity of lime sufficient to convert all the sulphuret of iron into sulphate of lime; for if this be not done, the sulphate of iron or copperas will be formed, which is known to be prejudicial to vegetation. The quantity required for this purpose will vary with the amount of sulphuret of iron; where the efflorescence is light, one bushel of lime to 100 of marl will be amply sufficient, and where it is abundant, it may be necessary to use two, three, or four to the 100 of marl. If the green sand contain already a portion of lime, a smaller quantity will be required. The best method of applying it will be to remove the marl from the pit to any convenient, adjoining spot, to form a stratum not more than two feet thick, and after it has been exposed to the air for two weeks or a month, to cover it over with slacked lime. After exposure to one or two rains, it may be then most thoroughly mixed by passing a plough through it, or digging it down with the spade.

§ 146. In what manner and in what quantity should the green sand be applied? All varieties of the marl are more or less compact, when freshly extracted from the pit, and if applied in such a state would be unequally distributed over the soil, and hence the first precaution is to suffer it to be exposed to the air for a few days, according to its compactness or tenacity, in order that it may crumble to powder if possible, for the finer

the pulverisation, as shown of lime sec. 135, the greater will be the immediate benefit. There is another advantage attending this delay, that we may then observe the efflorescence, sec. 145, and obviate its ill effects by lime. Indeed, in a majority of cases, the addition of lime in small quantity will prove serviceable, since it is generally wanting in the pure green varieties, and yet it is an important requisite in the fixed constituents of vegetables. The most economical method of applying the marl as above proposed, will be to cart it from the pits immediately into the fields, to which it is to be applied, to throw it into heaps at convenient distances for spreading, and then to put a small quantity of lime on each heap, excepting in the case of those noticed, sec. 145, which should remain exposed to the air for a longer time. In regard to the quantity to be applied, a variety of opinions exist, and hence from 50 to 1000 bushels per acre have been tried, with and without success. A little attention to the theory of its operation, sec. 142-4, will enable us to approximate to the true proportion. Its strong bases appear to act on the organic matter in the soil, and to combine with it, hence it would be useless to apply a large quantity to a poor and light soil, for which 60 to 100 bushels would suffice, but a clayey soil would be rendered looser by it, and as there is usually more organic matter present in such a case, from 100 to 200 may be employed with advantage. Where the land is already of good quality from 200 to 500 may be used, according to its richness and tenacity. Many persons believe that because one kind of marl is inferior to another, a much larger quantity will be required, but the truth is, that the differences, although important, are less so than is generally believed, and should not lead to the employment of quantities greater than have just been enumerated. Notwithstanding the effects of marl will be shown to be striking on ordinary, and even on very poor land, yet it is essential that the soil should contain a fair proportion of organic matter in order to reap the highest benefit from it. Hence the failure of some experiments made with the green sand, for although it stands superior to lime in requiring the presence or addition of less organic manure, still the views offered to explain its mode of action show the necessity of some organic materials on which to operate, and this conclusion is strengthened by experience.

§ 147. The difficulty of overcoming prejudice is clearly exemplified in the progressive employment of green sand in Delaware. One of the first experiments made with it in St. Georges hundred may probably be dated as far back as the year 1826, when a small quantity was drawn out from the site of the canal. One spot of ground where this was applied was observed in 1837 on the farm of James Wilson, 11 years after its application, and although that soil had received no other assistance, a luxuriant growth of corn clearly pointed out the limit to which it had been spread. Notwithstanding the satisfactory results of this and other experiments on this calcareous marl, how short a time has elapsed since enterprise opened an inexhaustible source of fertility from near the Deep-cut on the canal to within a sort distance of Delaware City. When the survey was commenced, although many persons were well satisfied that the calcareous marl of the canal would prove beneficial to the soil, yet proof

is not wanting to show that there were not ten persons who placed confidence in the effects of the pure green sand, and not four who relied upon its efficacy with such a faith as to induce them to apply it to their soil. The labors of the geologist were chiefly directed to pointing out every inducement to its application by personal intercourse with the inhabitants of that section of country where it is found, rather than to a devotion of his time towards its discovery in new localities, or its farther examination where an opening had been already made. He pointed to its increasing employment, and estimation in New Jersey, proved its value from chemical reasoning on its composition, determined in a general way its boundaries, and urging all to search for it, exhibited or explained the manner in which research should be undertaken. The result was as had been anticipated; men of enterprise taking the lead, it was searched after, found in numberless places, applied to the soil, and its effects forced conviction in the minds of many. Others withheld their assent to its utility, and some even endeavored to dissuade their friends from its application, but the writer, aware that the strongest prejudice must eventually give way, pursued his undeviating course by still urging experiment as the surest means of ascertaining its effects. Notwithstanding the proofs of its utility drawn from Jersey, and from its limited use in Delaware—although many of its former opponents are now its firmest advocates—while land has been evidently benefitted by its use, and has increased from 50 to 100 per cent. in value—it will scarcely be credited that there are still a large number of individuals in St. Georges hundred who either believe that it is not endowed with fertilising powers, or are persuaded that it is absolutely detrimental to the crops. To such may be pointed out the results obtained by their fellow-farmers, as exhibited in sec. 148 to sec. 152, we might say, look around you and observe what your neighbors are doing—try one, two or more experiments—and if you are not then satisfied, all that can be said is, desist and let your fellow-citizens grow more wealthy by the employment of marl, and resting in your antiquated systems, do you remain at a still-stand until you shall regret your delay.

§ 148. It may be deemed improper to withhold all the information which has been acquired relative to the effects of marl in various parts of St. Georges hundred, and yet as giving it in all its detail would swell the present memoir to a large volume, we must be content with a cursory notice of a few of the results obtained with the several kinds. The cretaceous green sand on the canal sec. 53 to sec. 56 has been longer known and tried, than any other, excepting in one instance on the Bohemia, but as all appear to be well satisfied of its good effects, we will dwell on it no longer than to refer to the enterprising and skilful farmers of its vicinity, who are rapidly restoring fertility and beauty to a soil that had been impoverished by the injudicious systems of their predecessors. The decomposed and indurated marl on the Bohemia secs. 57–59, is very variable in its character, and consequently produces different effects. A portion of that described sec. 57, which is indurated, but scarcely decomposed, was taken from a pit shortly after the close of the last war, and applied to a small square of ground on the land of H. Freeman, adjoining the

road to Murphy's mill, on the Bohemia, and although it has lain on the soil for upwards of 20 years, and been cultivated with the rest of the field, the quality of the crops in 1839 afforded a test of the quality and durability of the marl, so remarkable and satisfactory, that by tracing the outline of the square by the luxuriance of its vegetable productions, this was found to be the limit of the marl, as proved by the broken shells on the surface of the ground. Wm. Polk made use of the same marl in 1837 on a soil then not worthy of cultivation, and in 1839, the clover crop on it was unusually large and thrifty. That portion of the marl lying on or near the Mill-pond would at first sight appear to be too far decomposed to be useful had not J. Smith proved that it still contains sufficient green sand and calcareous matter to benefit his crops. The shelly variety of the calcareous marl, sec. 60, has been successfully tried. J. Whitby spread 400 bushels per acre, and the effect on oats was nearly equal to stable manure, on corn very striking, less so on grass. As remarked, sec. 144, these calcareous marls owe their effects both to lime and to green sand, and hence the less yellow sand they contain, the greater their value, but whether their effects are due more to the lime or to the green particles will not now be decided.

§ 149. The most striking effects have resulted from the use of the bluish green sand, secs. 62-63. Z. Glazier marled on wheat and rye, the latter of which was better than ever raised before. A field had been limed; a large portion of it was manured, and the remainder marled with 300 bushels per acre, excepting a single land between the two parts, which was only limed. The manured proved best, the marled but little inferior to it, and the intervening strip which had been limed, did not appear to produce more than one-half as much. J. Vandegrift's marled wheat appeared as well as the manured by more than doubling the crop. S. Townsend spread 300 to 500 bushels per acre, where the latter quantity, the crop was stronger; he manured in the same field and there it was generally, but not always better than the marled, but where marl and manure were together, the growth was very heavy; the effects of the marl and manure separately, were such that it was difficult to say where the one passed into the other, but where neither was placed, the crop fell off to less than half; in one part, the marled, and that without any kind of manure exhibited an estimated difference of 20 to 8 bushels of wheat; the effects were also striking on other crops. On the farm of Mrs. Sims the effects were equally remarkable, for according to the estimate of several individuals the produce of corn was doubled, and the extent of its application might be defined to a line from the increased luxuriance of the crop. The marl of G. Karsner has had the test of more lengthened experience than any other of the varieties of non-calcareous green sands, and the results of some of his experiments are detailed in the Farmer's Register for 1838. In 1839 the effect on oats was little if at all inferior to manure, and the superior growth of the crop might be seen at some distance. It was observed that the stalks had a yellowish color, which G. K. remarked was usually the case, and alarmed at such a result the first time, he measured the grain from a given piece of land and found it

greater in bulk, and that it had five pounds more in weight to the bushel. The effect on wheat was nearly equal to that produced by manure.

§ 150. The yellowish green sand has been well tested, and so well convinced were the enterprising holders of the land where it is found of its great value, that they had extracted up to the close of the survey more than had been employed in all the remainder of the hundred. The effect of J. Rogers' marl on oats was so striking, that the land not marled adjoining that which had received its covering of marl, was aptly compared to a road passing through the field. Indeed from all his experiments, he is so well satisfied of the benefits accruing from the employment of marl, that he has caused to be spread not less than 100,000 bushels. E. Croft was not satisfied of the result of his experiments for 18 months after the marl was spread, but finally became convinced that it had materially benefited the soil. Wm. Polk had extracted largely, and covered his land in the vicinity of the pit, but with a success inadequate to his expectations, a circumstance which may be attributed to the already superior quality of the land attained by the use of other manures; for where it is improved, the increase of produce is far from being in direct proportion to the quantity or quality of manure applied to it, and even where the best materials are employed, the difference in the crops may not be perceptible to the eye, and only becomes evident by measuring the product of equal extents of land of similar quality, manured and unmanured. Dr. Uhler spread marl over poor land at the rate of 350 bushels per acre; one acre was left unmarled, and a sty or pen had been located in another part of the field. It was put in corn, and he estimated the marled corn at four times the amount of that unmarled on equal surfaces of soil, while no difference was observable between that portion where the pen had been, and the adjoining marled soil. Others have experimented with the marl in the vicinity of the bridge, some successfully, and others less so, but all will probably be soon convinced by the results daily observable around them.

§ 151. The opinions of those who have tested the black-colored sand, sec. 68, are more discordant than the preceding. S. Higgins had not obtained confidence in his own marl, although he believed that of G. Karsner did produce some benefit. Where the stratum crops out in his field, it has often been remarked that the crops were there most rapid in their growth early in the season, but that after the summer's heats began to be felt by vegetation they usually "burned up." What better proof can be required of the value of the marl, than that an excess of it, after producing luxuriance, should eventually destroy vegetable life!—J. Jefferson has made experiments on his land, and although successful, the result has fallen short of his expectations. J. Dale's experiments on different crops and applied in various ways, have proved eminently successful. The effects upon the corn might be traced to the exact limit of its application, and compared with that which had received a good dressing of stable manure evinced a trifling inferiority. On an impoverished sedge field it produced a good growth of white clover.—To the W. of Port Penn, J. Cleaver, sec. 69, has tried a few experiments with varying success, but on the whole, he was not satisfied of the value of the marl.—T. Stockton's marl, sec. 70, applied in various ways proved decidedly bene-

fiel, for where put on buckwheat in 1838, the difference between that marled, and that manured would strike an ordinary observer, and in 1839, on oats, it evinced equal service. The trials made by L. Vandegrift were sufficiently decisive to induce its extensive application.—C. Vandegrift was not satisfied in 1838, with the results he obtained by employing marl.—W. Bennet also drew unfavorable conclusions relative to its use, but the causes of this were pointed out in sec. 70.

§ 152. Experiments with the marl of § 72, are too recent to admit of their being detailed. J. Driver, § 73, has tried the marl with success, and attributed the unusual productiveness of his garden in 1829, to a very heavy dressing of marl which he had given to it the preceding year. J. Clayton has made numerous and well-directed experiments on marl by comparing it in its effects with other species of manure. Its effects on oats were not striking, while on the corn, it would be difficult to decide whether it does not equal the best manure in one experiment, and in another it is decidedly superior to manure from the sty (pen manure.) These and other trials, which it might be interesting to enumerate, if time and space allowed, were carefully conducted by J. Clayton, on ground of uniform quality, and to such an extent as to admit of observing the results at some distance. J. Mansfield's green sand submitted several years since to experiment, was found to be of utility and in some cases little inferior to ashes, but the result of later trials is not known. C. Haughey found some benefit on several crops, but the want of more striking effects must be attributed to the presence or formation of copperas, which will be determined by the result of two years application, when the operation of the latter, having ceased, the action of the marl will be more distinctly observed. The results of trials made by J. Rogers and A. Lewis, were not witnessed but are said to be favorable. H. Templeman's employment of the same marl on oats sufficiently prove its efficiency. It would be advisable to mingle a little lime with the marls noticed in the present paragraph for the reasons stated § 145. The *green* marl of H. Templeman also proved to be a useful source of fertility to the crops. J. Jones, not possessing an accessible bed of marl on his farm, has with highly creditable enterprise procured specimens from eight different marl pits, which he submitted to comparative experiment on adjacent squares in a field, and although the results were different from what might have been anticipated yet they were sufficiently favorable to induce him to commence the marling of his farm with activity, and at a considerable expense, being obliged to haul it from a distance of three miles.—In consequence of the large proportion of sulphuret of iron in the "blue tenacious sand" of the Deep cut, it is not likely to be employed as a fertiliser, even if it could be procured with facility, but should it be employed, it will be necessary to adopt the precautions pointed out, § 145, and make free use of lime.

§ 153. Since both favorable and adverse results have been adduced, unfairness cannot be attributed to the statements given above, and from these we discover, that out of 29 who have tried it, and the results of whose trials were witnessed by the geologist, 14 have produced very favorable results, 11 simply favorable, two doubtful, and two individuals believed their experiments decidedly unfavorable. Let every one draw his

own conclusions with fairness, and form his opinions accordingly, and we shall soon see every doubt vanish before conviction. It is difficult to state the precise amount of marl already extracted, (1839,) but from all the estimates we can gather, the amount does not fall short of one million of bushels. Now supposing this amount correct, and that a bushel is about equal to a cubic foot, for a cubic foot of the compact marl will make nearly double that bulk when taken out of the pit, then the above amount already used is equal to one million of cubic feet. But the seven millions of cubic yards supposed to be accessible in Delaware, § 79, are equal to one hundred and eighty-nine millions of cubic feet, so that there has been used the 1-189th part of the green marl, and the amount remaining will satisfy every one that there is a sufficient quantity for the consumption of the district in which it occurs and for exportation. In conclusion, it might be supposed that something should be said relative to the methods of searching for, and extracting the marl, or constructing and draining the pits, but as experience has already facilitated these operations more than could be done by advice, it is not deemed sufficiently important to demand a place in the present work.

## SECTION V.

### *Marshy Soils.*

§ 154. The richness of the marsh lands in the Western and Southern parts of Kent and on the ridge in Sussex has been a theme of admiration to all who have visited them. They are situated on the branches of the several streams, which having their sources in Delaware usually flow towards the Chesapeake, and which originating from rains and springs in the midst of extensive forests on a broad and very flat surface with an argillaceous substratum impervious to water, and becoming clogged and dammed up by fallen trees, leaves and brushwood, naturally expand into broad basins, termed marshes. The luxuriant growth of trees, shrubs, and smaller plants, and their constant dilapidation and decay, in the shallow waters of the sluggish streams during the lapse of ages has generated a black vegetable mould, averaging three feet in depth, being rarely less than six inches and sometimes exceeding six feet, composed throughout of the same materials. It was not until the close of the past or within the present century, that effectual means were resorted to for recovering this land from almost constant inundation, since which time nearly all the great marshes have been drained by the excavation of ditches or more properly canals in the natural bed of the stream, and a large amount of the most fertile soil in the State brought under cultivation. One of these great drains increases from 12 to 24 feet in width from its source to its mouth, a distance of nine miles, and throws off a sufficient quantity of water in spring freshets to float a moderately sized vessel. The Culbreth, Cow, Herrington and Tappahanna marshes in the West of Kent county are the main feeders of the Choptank, and Marshy Hope in the South

forms a main source of the North West Fork River. The principal and several minor branches of the Nanticoke have been also subjected to drainage, beside many smaller streams in Sussex. When all the water-courses shall have been confined in a similar manner within their proper channels, a very large amount of an inexhaustibly fertile soil will be brought under the plough, and the noxious exhalations of marshy lands will cease to produce diseases to which their inundated state renders them subject.

§ 155. When we examine the soil thus wrested from the waters, an unusual uniformity of composition appears to prevail in it; it is black, very unctuous to the touch in its moistened state, rarely so light and spongy as not to admit of grain after a little cultivation, becoming sufficiently compact on drying and consisting of decayed organic matter and argillaceous earth. The organic matter chiefly humus-coal, and humin, sec. 111, a little of the humic and crenic acids, secs. 112, 113; and that it does not contain uncombined acids, such as the malic, acetic or phosphoric in quantity, is shown by its productiveness immediately after clearing sec. 119. The fertility of these soils is shown from the fact that some fields have been tilled in corn for 40 years in succession, without an apparent diminution of their productiveness; but nevertheless the idea, which seems to have become deeply rooted in the minds of the people of our western States, that such land can never be exhausted, cannot be too soon refuted and exploded in Delaware. No soil, however rich, can withstand excessive tillage, except it receive an adequate return of its richness; an assertion to which the experience of ages will bear witness, and which will be confirmed by the experience of the West, ere 50 years shall have elapsed. The quantity of organic matter in some of the marshes is so great that during a dry season, the soil which was accidentally fired, continued to burn like coal, and could only be extinguished by rain. The remains of such fires have been observed in several instances, where the carbonaceous matter having been burned out, left the earthy constituents converted into a substance resembling brick by the heat of the fire. It is said that lime applied to this land has sometimes been found injurious. It may admit of a doubt whether the experiments were judiciously made, but supposing that to be the case, it must arise from the existence of too much humin, or the organic acids, which the addition of lime would bring into a too rapid action. The proper course to pursue with it would be to give a very light dressing of lime, which has been exposed to air for some time in order to its combination with carbonic acid, in which state it guarantees a gradual decomposition of insoluble vegetable matters, as shown §§ 131, 132. There is one important use which these may receive and it is only surprising that so little attention has been paid to it; the adjoining lands, sometimes argillaceous, are usually light sands, and if a portion of the black marsh soil were spread upon them, it would render them both more productive and cohesive, and surely there is in nearly every place where occurs a superfluity which should not be suffered to lie unproductive.

§ 156. Similarly formed to the marshy soils and arising in part from them, are those black deposits in the creeks and branches, existing in

all parts of the State, but abounding in Sussex and Kent. They are largely composed of organic matter, but contain more earthy constituents than the preceding, and appear to be better elaborated, and prepared for use. In a majority of cases they may be directly applied to land without mixture, and will prove a very valuable substitute for manure of the organic kind, but if extracted where the tide flows, it will often be requisite to expose them to frost, or mingle them with lime, or submit them to both, prior to their employment. It is not merely in larger streams we are to look for this material, but in small branches, brooks and even in the courses of springs; it may be found on nearly every tract of land in the State, and more especially to the south. It is a source of fertility within the grasp, and certainly within the means of every citizen, and it only needs to be tried, fairly tried to gain it a lasting reputation as natural organic manure. Experiments have been made with it to a very limited extent, and although successful, it is surprising that its use has not extended; for in some instances, applied alone it has doubled a crop of corn in the first season, and exhibited good effects for many years; with lime it has produced similar results which will stand the test of a longer time. This vegetable soil is not always uniform in its composition, for although in creeks it is usually black, and earthy, yet in some small upland ponds or swamps it is brown, light and spongy. In the latter case in particular it should be employed in connection with lime in the caustic state, i. e. freshly slacked, to promote incipient decomposition, and to correct acidity, and even in all instances of its application, lime will benefit it and insure greater durability of action. Many farmers in Delaware, really desirous of improvement, know not where or how to commence, since they cannot raise one-fourth the quantity of manure requisite for restoring productiveness, and their farms are extensive. Here is a material, with which to make the first attempt; let them use it alone, and if it prove good, continue until means are obtained to employ lime in addition to it; if the result be not favorable alone, let it be carried to the barn-yard, to form a layer of it there, and when its surface has been covered by manure, let them bring in another layer, and in such a manner, the quantity of manure may be increased many fold, without deteriorating its quality.

§ 157. From the upper part of the State to its southern boundary the Delaware river and bay, and the sea-coast are skirted by flat lands of varying breadth sometimes exceeding a mile, subject at times to inundation, consisting of a flat, and dark colored vegetable mould, clothed with a luxuriant growth of reeds and grasses. Supposing them to average a mile and a half in width through the whole length of the State, we would have about 100,000 acres of Delaware marshes, a large extent of land, which if it were brought under cultivation, would prove to be the richest land in the State. Its depth and richness of soil, and the ready means of restoring it when exhausted, are ample proofs of the assertion, but it may be reasonably doubted whether so great an undertaking as reclaiming this land at the present time would meet with an adequate return, when we consider its expense, the comparative paucity of population, and the imperfect system of agriculture pursued in the State. The successful exe-

cution of a small portion of the task in the upper county is ample evidence that the work is practicable, and the experience, which Holland has attained on this subject during ages, could be wielded in Delaware. But since it is not at all likely to be brought into execution for a long period of time, why may we not derive some benefit from these lands at the present time? Independently of the embankment of small tracts along the shore, and without reference to the grazing of cattle on these natural grass lands, the soil of the marshes may, and should be applied extensively as a manure on the upland. The embankment of ditches where they are not otherwise required, may be employed; or the marsh may be dug expressly with the view of employing the soil as a fertiliser, and it is such a vegetable mould which is chiefly required in Delaware to render it more fertile. The marshy deposit to which allusion was made, sec. 101, is variously composed, or more properly speaking, it is in different states of decomposition; being sometimes a black, unctuous matter, both vegetable and mineral, containing no traces of vegetable fibre, again a similar soil with fibre, and lastly a formation consisting chiefly of fibre or the undecayed roots and leaves of plants. The first of these, is the most valuable, and may sometimes be directly applied to land without admixture, but it is advisable to adopt a uniform method of using it which may be done in two ways, by mingling it with lime, better after exposure to the air for some time, or by drawing it into the barn-yard to bring it into an incipient fermentation by contact with stable manure. In either case it will more than repay its expense, and if lime be employed on the land at the same time, a more powerful and durable influence will be derived from it. There is one kind of material bearing some connection with the preceding, a species of sea-weed, observed along the shore of the bay, but more remarkably constituted on the beach a few miles below Lewes, which will prove of great excellence, when brought to an incipient fermentation, as it contains much blue mud, and is penetrated, and inhabited by numberless shell-fish. It would become more useful if drawn into the barn-yard, and suffered to ferment in a slight degree, for the decomposing animal matter, will bring the weed rapidly into a similar state.

§ 158. There remains yet one other substance, which is easily obtained, and will repay the expense of its application to the soil. It is the "blue mud," sec. 101, which is constantly depositing from the river and bay, on the marsh lands under the circumstances pointed out in the paragraph referred to. The fertility of those lands of which it forms the upper surface, and its beneficial effects in the few instances in which it has been employed on the upland are a warrant of its fertilising powers, but it is a matter of some doubt to what substances its effects are mainly to be attributed. Its basis is a fat clay, both lead-colored and yellowish, with a quantity of organic matter, which appears to be chiefly in the state of crenic and apocrenic acids combined with the oxide of iron. There is no doubt that it would be advantageous if applied directly to the soil, but its tenacity is an objection to such a mode of using it, and hence it is more advisable either to draw it into the barn-yard, where it will be broken down and mingled with manure, or to mix it with lime, and expose it for

some time to the air, adding at the same time, the black marsh soil, which is generally to be obtained in its vicinity.

§ 159. In the present section our attention has been devoted to a fertilizing ingredient of a high order, which we have denominated "*Marshy Soil*" in order to embrace the several varieties under one head; in agricultural works it might be termed a *peaty* soil, but the term would not include all those which have been described, for the "blue mud" is wholly unlike a peaty soil, but being deposited on the river-marshes, it soon becomes a marshy soil, and many of the creek and western marsh deposits are far from being peaty, although they contain much organic matter. From a careful perusal of the section, it will be observed that this source of fertility is every where abundant, and in the two lower counties may be said to lie within the grasp of every farmer; let it not, therefore, as is too often the case, be disregarded or undervalued, for its abundance and convenience, but applied judiciously, frequently, and profusely. Its value rests not on a mere theoretic assertion, but it has received the test and sanction of experience, and such experience both in Delaware and elsewhere, as may not be contradicted. As it would be a matter of nicety to discriminate between such varieties as are not sufficiently decomposed, and require some preparation prior to their application, and those which might be directly employed, it would be better to adopt a general rule relative to the mode of using it, viz., either to draw it into the barn-yard, or to form a compost with lime, or with ashes. In either case it will form an excellent manure, and with lime or ashes a durable one. It is indeed a fortunate circumstance that this valuable material is diffused in such abundance over the State, and not less gratifying that it is more widely distributed in Sussex and Kent counties, where the soil chiefly requires the addition of organic matter to restore it to its former fertility or even to excel it, and where it is of such a peculiarly light character as to require the use of precisely such a substance to render it more compact and tenacious, and more capable of repaying the expenditure of time, labor and materials, liberally bestowed upon it by the hand of industry and enterprise.

## CHAPTER II.

### ARTS OF CONSTRUCTION.

#### SECTION 1.

##### *Architecture.*

§ 160. *Gneiss*, §§ 25 to 30, being more abundant than any other rock in the northern part of the State, and of ready access, is more generally

employed in ordinary architecture, not often it is true in the construction of entire buildings without the assistance of other materials; but in laying the foundations, its indestructibility under ordinary circumstances renders it an almost indispensable material. Its regular stratification and the readiness with which it yields to force applied in the direction of its planes, together with the varying thickness of its laminæ afford great facilities in quarrying; nor are these advantages appreciably diminished by the presence of garnets § 27, nor by the quartzose and felspathic veins, § 29, which render the plane of stratification somewhat tortuous, for this effect is local, and limited to slight deviations, while the general direction of the planes remains the same, § 30. The slightly roughened surface of the rock offers another point of utility, by which it is enabled to hold mortar with greater firmness. Being softer in texture compared with the felspathic rocks, it is more readily bored for blasting, and very susceptible of receiving any required form under the chisel. The advantages of its employment, therefore, are its abundance and ease of access, of blasting, quarrying, and forming, and its firm retention of mortar. What are its disadvantages? The principal one lies in its destructibility, as shown § 25, but even this disappears upon closer inspection, for in the cases alluded to, it has been exposed to decomposing influences for an incalculable length of time, infinitely beyond that which can possibly be required for any architectural purposes, § 25; and farther, although there are places in which it has lain imbedded in walls for more than 100 years, it still presents no evidence of decay. That constituent most subject to decay is evidently the felspar which forms kaolin or china-clay, where it is sufficiently abundant, and undoubtedly assists in imparting richness to the soil. We have sufficient evidence of the great durability of mica from its diffusion in the soil, while other ingredients of rocks disappear, and from its constituting a part of secondary formations, but there are circumstances under which even this substance is subject to change, for the Danish chemist Forchammer has observed that if particles of mica be suspended in water, and sulphuretted hydrogen passed through the liquid, the mineral then becomes soluble in acids. On the other hand a highly micaceous gneiss is so little affected by fire, that it is often employed in the construction of furnaces. Considering then the circumstances under which gneiss is applied in architecture, it must be viewed as a very convenient, substantial, and therefore highly valuable species of rock. All its varieties however, are not equally good, for in some of them the felspar has already undergone a partial decomposition and become soft and friable, sec. 25, an observation that applies more particularly to the surface of the formation. Hence in searching for a good material for building, it will be advisable in nearly every instance to remove the surface, perhaps several feet in depth, before obtaining the rock in its undecomposed state, in which condition alone it should be employed in fine and ordinary architecture. It is not probable that rough or dressed blocks of this rock can ever constitute an article of export from Delaware, since the river is bordered by the *blue rock*, but altered gneiss, or the felspathic rocks which will be presently noticed, may hereafter constitute a source of revenue to the State.

§ 161. The situation of the felspathic rocks, § 31–37, on or near navigable waters, leads us naturally to inquire how far they may admit of application to the arts of construction. Both the fine and coarse-grained varieties possess hardness and toughness, which are important characters for the purposes designated, but at the same time may often prove a drawback on their utility from the increased difficulty of quarrying and dressing them. There is, however, a difference between them, for the coarse-grained, containing a large proportion of felspar, and relatively less quartz is softer and more yielding to steel, and hence one chief reason why it has been extensively employed for railroads, and is now being used for supports in the lower stories of large stores in Philadelphia. Its employment in the latter instance shows also that, notwithstanding its hardness, it may be chiseled and sculptured into ornamental forms. It possesses another advantage in being destitute of lamination, for which reason it may be split by wedging in any direction. This method of splitting consists in drilling holes in any given line, straight or curved, filling them with wooden wedges, and forcing iron wedges into the wood, until the block is severed from the mass. The fine-grained variety containing more quartz, is harder and more difficult of drilling, and although often laminated, is so compact that it may be split at any required angle to the laminae. The cause of that remarkable tendency to disintegration in certain parts of the coarse-grained rock must be left unexplained, but the fact does not interfere in the least with its general character nor with its value, for such parts are easily known, and are very small relatively to the mass of the formation.

§ 162. Much of the blue rock of Delaware has been employed in the construction of a great national work, the Breakwater at the mouth of Delaware bay, and a question of no easy solution offered itself some years since, in regard to the relative values of gneiss and blue rock for this work. The importance of the undertaking considered in a national light, should certainly banish all attempts at State or local feelings or influences. The opinions of the author on the subject were embraced in part in a report of the Franklin Institute, nor has a closer observation since that period changed his views. As the question stood, “which rock was better adapted to the purpose,” the answer was clearly pointed out in the superior gravity, hardness and toughness of the blue rock, which were conceived to be important characters. But it was urged that this rock was liable to decomposition, which is shown to be true of the coarse-grained variety in only a few instances observed at the quarry, sec. 34, and as may be seen at the Breakwater. The gneiss could, however, be obtained at a lower rate, from the greater ease with which it is wrought, and this circumstance was evidently greatly in its favor, where enormous quantities of stone have been, and will still be employed. There was another view which was adopted by the writer contrary to the opinions of those who favored the blue rock, that although that formation was superior to gneiss in point of hardness, toughness and gravity, yet that the latter can be, and is quarried out, possessing those characters to a sufficient extent to justify its employment. He deems it his duty to present this concise statement of views, since his appointment to the survey of Dela-

ware, necessarily called for an expression of his opinions, and before leaving the subject, he would point out the necessity of a strict inspection of the materials employed at the Breakwater, from whatever sources they may be derived, as inferior qualities of stone may be obtained at the quarries of blue rock in Delaware, as well as those of gneiss in Pennsylvania.

§ 163. The blue rock has been wrought for many years on the shores of the Delaware, and from its well ascertained characters, the unlimited supply which the formation can afford, and its proximity to tide water, it is highly probable that its consumption will continue to increase. If durable monuments be required in commemoration of events or individuals, this rock is well adapted to the purpose, while its color would equally suit the heavy gothic arch, or the ponderous Egyptian pile. It is not, however, confined to the shores of the river, for we find it holding a firm situation several miles up the Brandywine, and appearing at distant intervals in the midst of the gneiss, which it usually assimilates more or less to itself. This altered gneiss is better developed on the Brandywine near Gilpin's mills, § 36, and displays a light gray rock of a texture, hardness and toughness, intermediate between gneiss and the felspathic rocks, from which, and from its cleavage in the planes of stratification, it deserves a high rank among the formations of the northern part of the State. The extension of quarries in the blue rock, consequent upon a presumed increasing demand, will in all probability discover new varieties, which may even possess advantages superior to those described, by combining all the desiderata of materials for architecture.

§ 164. Limestone has ever been regarded as a valuable building material, and as it occurs presenting a variety of colors and of other external characters, is justly viewed as one of great beauty. In Delaware we have chiefly the white and gray, both of a crystalline structure, and in the lower part of Jeanes' quarry beyond the influence of atmospheric agents, it is massive and heavy bedded, and may be obtained in blocks of large dimensions, sec. 39: as the formation is limited, sec. 39-41, there is no probability that it will ever be extensively employed in architecture, particularly where the gneiss and blue rock are so abundant and easy of access.—Serpentine has been employed with success in building, as witnessed by specimens in, and near Westchester, Pa., and its shade of green unquestionably produces a novel and pleasing effect. It may be similarly applied in Delaware, but its small extent sec. 42-43, limits its utility. Although detached granitic veins are frequent, yet they are too small to admit of their application to architecture.

§ 165. The upper hundreds of New Castle county abounding in rock formations, may be conveniently distinguished from the remainder of the State by the appellation of the rocky region. It is not, however, exclusively so; for there are two other instances of rock formations among the sands and clays farther south. One of these noticed, sec. 61, may even now receive a partial application in building, and may be more extensively used when heavier beds of it are discovered. The other described in sec. 83, is a valuable material as far as regards its durability, hardness and toughness, but like the preceding requires extent to permit its classification with useful building stone.—The large number of small ferruginous

springs throughout the lower part of the State, and the abundance of oxide of iron in the sandy strata, are the frequent cause of the partial induration of the formations, as exhibited in numberless ferruginous crusts, or iron-stone, in which sand and pebbles are cemented by oxide of iron, but they are too unimportant to require more than a passing notice. Beside these formations lying in their natural beds, there are numerous boulders, or erratic blocks sparsely strewed over the surface, derived from the more northern rocky regions, and transported to their present isolated situations by currents of water, when the whole surface of the land was at a relatively lower level than it is at the present period of time.

§ 166. It might appear a useless proposition to offer clay as a material adapted to architecture, were it not that it has met with successful application in other countries, and received the stamp of success from the lapse of centuries. In Germany and other parts of Europe it has long been a custom among the less wealthy classes of society to employ clay largely in filling up the interstices of the frame work of their houses, which had been latticed by rough brushwood, and branches of trees, and it is worthy of observation that when the weather surface is properly washed with lime, it becomes so hard in process of time as to resist atmospheric agents, and even tends to preserve the wood-work of the building. In some of the departments of France, and in parts of South America, they construct dwellings wholly of clay, which becomes sufficiently hardened to stand alone as a durable wall. Dr. R. M. Bird first suggested to the author the practicability of making such constructions in Delaware, and although it appeared at the first view impracticable, yet a more mature consideration of the mode of operating with the clay, and the evidence offered by its employment abroad, led to the conclusion that it is deserving of especial notice among the materials used in the arts of construction. It is applied in a state approaching to dryness, the blocks of clay being rammed tightly into a form of wood which is raised in proportion as the wall advances in height. The conveniences of such a construction in Delaware arise from the abundance, diffusion, and qualities of the clay-deposits from the northern to the southern limit of the State, while its general advantages lie in the simplicity of the means by which any given design may be accomplished, and consequent economy of the operation. A coating of lime on the exterior is sufficient to protect it against the destructive influences of rain, frost and heat, and appears to act chemically by combining with the constituents of the clay, and forming a hard mineral compound. Dr. Bird ascertained during the course of numerous experiments, that ordinary linseed oil mingled with a small quantity of drying oil, and applied by a brush, formed a superior coating for clay walls, rendering the surface harder and more compact, capable of withstanding atmospheric agents, and adapting it to the reception of ordinary pigments. A building well constructed after this method might vie with the proudest mansions in the beauty and durability of its architecture.

## SECTION II.

*Construction of Roads.*

§ 167. While the citizens of the United States are intently pursuing a course of public improvements in the construction of rail-roads and canals, they have been misled by their advantages in suitable locations to neglect the improvement of ordinary roads. Where the former are intended to bring distant places into a closer proximity, or to render the means of conveying large amounts of natural or artificial productions more convenient, expeditious and economical, our common roads, designed as the medium of intercourse for comparatively short distances and of conveying smaller bulks or products, are equally deserving of our attention. Although the increasing wealth and populousness of Britain originated those excellent roads which cover the United Kingdom like a net work, their number and excellence undoubtedly reacted by developing and diffusing the resources of the interior, and consequently by raising its wealth to a still more elevated point. Like causes must produce like effects in a nation derived from and similarly constituted to Britain; for which reason more care should be exercised in the improvement of our common roads. It is not presumed that every unimportant road should be converted into a turnpike, for the absence of a dense population forbids it, but the principal thoroughfares can and should be bettered by the application of such materials to them, as are found in their vicinity. Roads which are in constant use should receive a covering of a hard and durable material, such as broken stone and gravel, but those less frequented may be amended by the less expensive application of clay, sand or loam, according to the nature of the substratum or soil.

§ 168. The macadamised road is unquestionably that form which combines the greatest number of advantages, examples of which are the five turnpikes leading from Wilmington. But these are far from being good specimens of this kind of road, for the principles of their construction have not been adhered to, the principal objection to them being the large size of the pieces of stone, which will ever prevent the attainment of an even surface; another is the practice of covering the stone over with a layer of earth. Stone-pikes are sometimes carefully and properly constructed at first, but when they become rut-worn are often repaired by throwing heedlessly on them mingled earth and stone, dug at the side of the road or at the nearest possible point for convenience. The national road is a well-constructed macadamised road, in many places of perfectly even surface, but instances have been seen where, to obviate the destructive effects of a heavy rain, earth and stones of large size have been thrown on it, which rendered it about equal to a common turnpike road. There is an abundance of stone in the upper part of New Castle county of superior quality, possessing the desirable properties of extreme hardness and toughness, and breaking into sharp angular fragments. The best

rock for the purpose is the blue rock of every variety; the hard gneiss, although a good material, being rather inferior to it. An objection urged to felspathic rocks is the greater difficulty and expense of breaking them, but the coarse-grained formation at Quarryville offers a material admirably adapted to roads, as it decomposes in some portions, sec. 34, crumbling into small angular pieces, which will be compacted and solid. The same kind of road may be constructed nearly as far south as the upper part of Kent county by employing erratic blocks and pebbles, which when fractured afford a superior and very durable material. Nearly all the fine roads in the northern part of Prussia, within fifty miles of the Baltic, are thus constructed, on a level country not unlike the two lower counties of Delaware.

§ 169. Instances of gravel roads are met with in the central parts of New Castle county, which are nearly equal in value to those constructed of broken stone, exhibiting an inferiority only in long-continued wet weather or during the thawing of the winter's frosts. Their superiority to ordinary roads should point out the propriety of transporting gravel to the latter, for although the expense of their construction may be greater at the first, yet their greater durability reduces the actual outlay nearly to the same amount. Gravel is found abundantly in the upper and middle sections of New Castle county, §§ 46, 50, 51, 52, in sufficient quantity in the lower part of the same, §§ 55, 56, 67, 69, 80, and in Kent, §§ 82, 84, and exists in several places in Sussex, § 89. Some attention should be paid to the character of the substratum, for if it be a light sand, the gravel will not produce a material improvement, while on clay or better on an argillaceous sand, it will become compact and durable. The remarks just made, §§ 167, 168, refer more particularly to the leading thoroughfares of the State, which should evidently be rendered more suitable for transportation and travel through as much of the year as is practicable. The advantages of such improvements would not merely affect the inhabitants of that particular section where they are made, but a large portion of the State.

§ 170. The local advantages derivable from the improvement of less frequented and smaller roads might be shown to be fully commensurate with the outlay which they ought to receive; nor will the expenses attending it be much greater than at present. The principle on which this improvement depends is founded on a change of the soil; when it is clay, sand should be added to it; when sandy, clay should be added, in order to attain a mixture of the two in which sand should predominate. Now by the usual method of digging or ploughing up the side of the road and throwing the earth on the centre the same kind of soil is added, and a sandy road only benefitted for a short time by the little clay which fresh soil contains, whereas if a little more expense were devoted to searching for clay or sand, in proportion as either is required, and applying it, a good medium will be attained, which after short use, will become hard and compact. A light sandy road is very good in the winter season, and moderately good after rain, which renders it more compact, but at other times it is very objectionable;—a clayey road is worn into deep ruts during the winter, which becoming frozen, renders it exceedingly uneven,

while after heavy rains and when not frozen in winter it is almost impassable. A suitably mingled sand and clay is in better condition during the summer than sand and during the winter than a road composed of clay alone; is not as easily rutted by rains and becomes sooner smooth after rain. In short, it is superior either to sand or clay by being useful through a much larger portion of the year. Where gravel can be obtained it ought to be employed in preference to sand. It is a fortunate circumstance in the deposition of the various strata, that both sand and clay accompany each other throughout the State and are accessible in almost every place where a road is located; nor ought their application to be limited to ordinary roads, for they may be employed for improving the principal thoroughfares in the lower part of the State, in the absence of more valuable materials, stone and gravel.

## CHAPTER III.

### CHEMICAL ARTS.

#### SECTION I.

##### *Manufacture of Pottery and Glass.*

§ 171. The manufactures of pottery and glass, and particularly the former, are deserving our attention, since allusion has been made in the preceding pages to frequent localities of materials which are employed in them. The simplest but not the least important of these is the making of brick; the simplest, because it requires very little previous preparation of the materials, and is not attended by difficult processes in the progress of the manufacture; and important, because it obviates the necessity of drawing materials for ordinary and finer architecture from abroad. Happy is it therefore for the State that it possesses an abundant supply of these materials so extensively diffused, that a small district can scarcely be found destitute of them, and so conveniently situated, that a building may often be erected over the same spot from which was derived the substance employed in its construction. The substances used in making brick are clay and sand, mingled in due proportion. A very fat clay will not answer the purpose alone, as the contraction of the clay in drying produces fissures, nor will one containing a large proportion of sand, for in this case the brick is too soft and crumbling. A due proportion of sand and clay is therefore essential, which is best attained, where practicable, by mingling together fat and poor clays, or white and lead colored with yellowish and loamy clays. The former may or may not contain sand, the latter always fine sand, while their yellowish color is

derived from oxide of iron. The presence of the last named substance is essential, as it acts by cementing the clay and sand or alumina and silica. Hence the white clay, containing but little oxide of iron, can never form a strong brick, while the yellow alone containing too much ferruginous matter, is apt to enter into semi-fusion and become glazed. These effects can be ascertained practically by the *ring* of a brick; for if it produces very little sound on being struck, it is either not burned sufficiently or there is too little iron in its composition; if it produces a very sharp and quick tone, it is burned too much or there is an excess of oxide of iron in the clay. It follows from what has been said that the excess or deficiency of iron may be remedied by adding more white or yellow clay. Where the two clays are not found in juxtaposition or conveniently near together, if we have white or lead colored, a yellow loam is added; if a yellow clay alone, we add sand and use a less intense heat in the kiln. It is frequently advisable to try the mixtures on a small scale, preparatory to burning a kiln, on a smith's hearth or other convenient place, for even those skilled in the art cannot always judge of the fitness of a clay by its external characters. Of the geological formations many have been and are employed in this manufacture; the red clay of New Castle county, secs. 47, 52, and the yellow clay of Appoquinimink hundred, secs. 80, 81, the intermediate clays of Kent, secs. 87, 88, the lower clays of Sussex, secs. 89, 94, as at Causey's, sec. 89, and Parker's, sec. 90, the more recent argillaceous deposits near tide-water throughout the State, the clay of the ridge, as at Georgetown in Sussex, and numerous local clayey beds or loams scattered through the three counties. In all of these localities bricks are made of sufficiently good properties, in many of them of superior quality. The greatest difficulty in this manufacture is obtaining a good moulding sand, no localities of which have been found, excepting perhaps the stratum mentioned, sec. 85, which is probably too coarse for a fine quality of brick.

§ 172. There are deposits of clay in many parts of the State affording a sufficiently fine material for the manufacture of earthenware, stoneware and even fine pottery or English ware. For the former, several of those deposits now employed in the making of brick would be well adapted, if other purer clays were mingled with them; and indeed they may be employed alone, if previously and carefully subjected to the process of *washing over*, by which the coarser and finer portions are separated from each other, and the latter alone employed. As it is believed that this manufacture may be prosecuted in many parts of the State, the method of preparing clay for the purpose should be described. If clay be stirred up in water, and allowed to settle for a few moments, the gravel, sand and coarser matter will subside, and if the muddy liquid be poured off, the finest parts will finally settle down and may be obtained by pouring off the clear water, and partially drying the remainder. Carrying out the same operation on a large scale, we obtain a fine clay adapted to earthenware. By the old *blunging* process the clay was broken by picks, and worked up with water in a pit or tank by hand-paddles, suffered to settle, and run off through sieves into the drying tank. A far better, but somewhat more expensive method is the following. A cast iron cylinder of three feet

diameter, more or less, with wrought iron spokes attached to the interior sides at different distances, and projecting one third towards the centre is placed in a horizontal position; a shaft passes through the cylinder with similar spokes attached to it in such a position that when it revolves they will not interfere with those attached to the cylinder; the lower half of each end of the cylinder is closed by iron plates, cast at the same time. Clay is introduced at one end of the cylinder through the open upper half, and the shaft turned while the stream of water enters at the same opening. The clay and water are thus thoroughly mixed, and pass out of the opening at the other end of the cylinder, which is slightly inclined, into the first trough, in the centre of which is a deep and narrow wooden vessel, to receive the gravel and coarse sand. The muddy fluid still passes on to a sieve, through which it empties itself into a second trough—it passes through a second, and sometimes a third sieve, each one being finer than the preceding, into the slip-reservoir. When the water becomes clear in the slip tank, it is drawn off by opening pegs on one side, and the slip collected for use. The same operation is equally well adapted to stone as to earthenware. For the finer pottery, (queensware, &c.) the operation of blunging is best performed by throwing fine clay into a vertical cylinder or cone having knives attached to its inner surface and at right angles to it. An upright shaft has knives attached to it in such a manner that their edges pass close to those of the cylinder knives, in revolving, and cut or slice the clay between them, while by their blades lying in a spiral around the shaft, they force the clay downwards towards the bottom where it passes out at an opening. It is then put into the *large blunger*, where it is mingled with water by a vertical shaft with arms, and when the vat is full the liquid is allowed to stand for the coarser matter to subside, and then run off into the slip-reservoir. The former process for common earthenware, is successfully practised in Germany; the latter in England.—For earthen and stoneware, we have resources in the red clay of New Castle; the intermediate of Kent and the lower clay of Sussex. For fine pottery we might have recourse to the white clay on the Delaware below New Castle, and to the same wherever it may be found in the red clay formation of warrantable extent. Although this white clay is a source of revenue at present, from its exportation, yet were it to form the basis of finer clay manufactures within the State to which its quality adapts it, its benefit to individuals, and to the State would be increased an hundred fold. The mode of obtaining clay in a very fine state for earthenware has been more minutely described as the process appears preferable to those ordinarily adopted, and as that manufacture is more likely to be established than any of the others. But for this and other parts of the manufacture, reference is made to establishments already in successful operation.

§ 173. Allied to the manufacture of fine pottery is that of porcelain or chinaware, one of the most useful and beautiful of the arts, for the establishment of which materials are presented by formations within and near the State. The necessary ingredients of porcelain are Kaolin, Quartz, and Felspar, the latter of which is furnished in abundance, and of good quality by the spar quarries, secs. 44–45, and was used by the porcelain

manufactory at Philadelphia, when that valuable establishment was in successful operation. The blocks of quartz from the same vein, sec. 45. were also employed, and should more be required, a fine quality is found, and may be obtained in large quantity near Columbia on the Susquehanna. Although beds of kaolin are frequent in Delaware, yet being too small in extent or too impure, it may be obtained a little beyond the State line near Mill creek hundred, which was the source of that employed in the Philadelphia manufactory. For making the seggars in which porcelain is burned, and which is an important item in this manufacture, we may rely upon the red clay formation, the white variety and other parts of which are admirably suited to the purpose. Thus it appears that all the materials requisite for the manufacture of porcelain lie within the grasp of the upper part of the State, and should its establishment be attempted, it will prove a valuable acquisition not merely to Delaware, but to the artificial productions of the United States.

§ 174. The white clay below the town of New Castle, sec. 49, has been exported to various parts of the United States with a view to its employment in the manufacture of glass-pots, or crucibles in which glass is melted. It belongs to that variety of infusible clay, known as *plastic* or *pipe-clay*, being infusible in a powerful heat, merely caking together and becoming hard. Specimens of it are found nearly equal to the best German pipe-clay from Gross-almerode in Hessian, although in its general characters as a deposit, it yields place to the Hessian. Its unusual freedom from iron renders it of great value in the manufacture of glass pots, for where the oxide of that metal is present, it communicates color to the glass, injures the texture of the pot, and renders that part liable to fusion; hence where these particles of iron are found, they are removed at the beds or more carefully at the glass works. Its freedom from siliceous sand or grit is another property of importance, as it enables the workmen to give a smoother surface to the interior of the pots, and gives the latter greater compactness. This white clay then possesses properties which adapt it to the manufacture of fine pottery, porcelain, pipes and crucibles, for the latter of which objects it has been excavated for more than 40 years. There is no reason why it cannot be equally well employed in the others, nor why the manufacture of glass may not be established within the State; for although good beds of a sufficiently pure white sand were not observed during the survey, they possibly and probably exist in Sussex, and even if they should not be found, a glass house on tide-water could draw from the deposit in New Jersey. Enterprise and skill would certainly render such an attempt successful.

## SECTION II.

### *Minor Chemical Arts.*

§ 175. Although the manufactures of iron are the most numerous, varied and important, of all others, yet as we are only contemplating those

which draw upon the natural resources of the State, and since the comparative paucity of the deposits of iron-ore in Delaware will ever be a drawback on the extension of iron manufactories, the nature of this memoir restricts us to a few words on the subject. The several deposits alluded to in §§ 87, 92, 98, 99, have been principally wrought for exportation, the remainder having been reduced to the metallic state in Delaware either by forges or a blast furnace. The latter yielded a good metal, at Millsborough in Sussex, but is now out of blast. The forges are conducted in a very simple and ancient style, by mingling the ores and charcoal together on an open forge-hearth and urging the fire by a bellows, and as the fire decreases, by adding more until a sufficient body is obtained to form a bloom, which is then wrought under the tilt-hammer into bars of the required dimensions. From the absence of flux, oxide of iron must supply its place, and hence the loss of a large amount of iron in the cinders; the quality of the bar iron obtained is nevertheless superior. The quantity of ore raised in the State may be estimated at 200,000 tons, which have introduced more than half a million of dollars revenue into Delaware, but had this large amount been converted into metal within the State, the revenue would have amounted to several millions for the metal alone, independently of other arts originating from the employment of iron, which would in all probability have arisen and been successfully conducted. As a subject of interest might be mentioned the employment of green sand as a partial flux for iron ores. Limestone is the flux ordinarily employed, but as the green sand contains potassa, it would be a matter of deep interest to ascertain how far it may be substituted for lime, while at the same time its frequently large percentage of iron would assist in an increase of the metal. It is well known that potassa will form a more fluid glass with silica than lime, and as one object of the iron-smelter is to obtain a fluid slag through which the melted particles of metal may readily pass to reunite at the bottom, it is highly probable that this material might render important assistance in his operations. The quantity of silica in the green sand is, perhaps, too great, to admit of its application alone as a fluxing medium, but it may be united profitably with lime, or in order to employ a single substance, the calcareous varieties §§ 53-56, and particularly the cretoid might be used alone with advantage. It would also be a matter of some interest to ascertain what quantity of iron could be obtained from the pure green sand without the assistance of either ore or fluxing material.

§ 176. Sulphuret of iron occurs in numerous localities in the State, but in no place of sufficient extent to demand attention, excepting in that portion of the green sand formation traversed by the Deep cut; and even there, although masses of the sulphuret of considerable size are abundantly disseminated through the blue tenacious sand, §§ 77, 78, yet no one locality has yet been observed, which might be worked to advantage. By exposure to air and moisture, we have already seen §§ 73 to 75, and § 78, that the sulphuret is decomposed and converted into sulphate of iron or copperas, which sometimes detracts from the value of the green sand, § 143. A similar method pursued with the masses of sulphuret carelessly selected from the clay might be adopted on a large scale to

convert it into copperas, and the indications of the mineral in quantity are such as should induce those residing in the neighborhood to search for superior localities.

§ 177. Having devoted some attention to the construction of buildings from sources within the State, a few words should necessarily follow relative to the means of cementing building materials. More ample and satisfactory information on the subject of mortar may be attained by referring to a series of French essays, translated by Col. Totten, U. S. A., which appeared in the Journal of the Franklin Institute for 1839. The limestone found in the upper part of the State, yields an excellent mortar, when well burned and freshly slacked; and with proper care, one bushel of burnt lime will more than double its bulk. Beside the convenient proximity of the greater part of the State to navigable water, whence lime may be obtained from abroad, there are sources of the same valuable material in some of the strata of deposition. Thus, the large shells, chiefly *Exogyra costata*, and *Gryphæa convexa* and *vomer* in the cretaceous green sand, secs. 53, 56, in the indurated marl, secs. 57, 59, the smaller shells in the shelly green sand, sec. 60, may be profitably burned for lime, where stone-lime is not convenient. The indurated marl falls to pieces after a short exposure to the air, sec. 57, and this and the shelly varieties may be most economically used by sifting them in the same manner as gravel and sand are separated by a standing and inclined sieve, and then burning the coarser portions, which will contain as large a proportion of lime as many good limestones. Still farther south, advantage should be taken of the natural and artificial accumulation of shells which are often found of sufficient extent to justify their being collected for burning, and may be separated from the adhering earth in the manner just described, secs. 138, 139, 140. In the construction and burning of field kilns, which are ordinarily employed for shell-lime, no important improvement can be suggested, except it be the plentiful use of wood, in order that the shells may be thoroughly burned, for otherwise the lime will be of inferior quality. Even if it is intended for liming land, it should be brought to the finest possible powder, for reasons stated, sec. 135, which can only be done by a thorough burning and careful slacking. This caution is the more necessary, as some individuals are of opinion that a par-burning is decidedly preferable to one in which the lime becomes thoroughly pulverised.

On motion of Mr. Dale,

The House then adjourned until 3 o'clock this afternoon.

*Eodem Die, 3 o'clock P. M.*

The House met pursuant to adjournment.

Mr. Fisher, Clerk of the Senate, being admitted, presented for the concurrence of the House a bill which had passed the Senate, entitled "An act to amend the supplement passed January 25, 1830, to the act for the establishment of free schools."

And he withdrew.

On motion of Mr. Higgins,  
The said bill was read.

Mr. Barr laid on the table the following joint resolution, which

On his motion,  
Was read, to wit:—

*Resolved by the House of Representatives, by and with the concurrence of the Senate, That* \_\_\_\_\_ *be, and he is hereby appointed Auditor of Accounts.*

Mr. Dale, chairman of the joint committee to settle with the State Treasurer, asked leave on behalf of said committee, for further time to report.

On motion of Mr. Clements,  
Leave was granted.

Mr. Collins, chairman of the committee to whom was referred the petition of James Scott, in relation to vacant land, reported a bill entitled "An act to enable James Scott to locate certain vacant land in Broad Creek hundred, Sussex county, and to complete his title to the same."

On motion of Mr. Collins,  
The said bill was read.

Mr. Fisher, Clerk of the Senate, being admitted, presented for the concurrence of the House, a bill which had passed the Senate, entitled "An act to divorce Elender M'Gee and Edward M'Gee from the bonds of matrimony."

And he withdrew.

On motion of Mr. Clements,  
The said bill was read.

Mr. Clements laid on the table the following resolution, which

On his motion,  
Was read.

*Resolved, That the House go into committee of the whole on the morrow, for the purpose of taking into consideration the Message of the Governor, delivered to the House on the sixth instant.*

The same gentleman gave notice that he should to-morrow morning call up said resolution for consideration.

On motion of Mr. Betts,  
The House adjourned until to-morrow morning at 10 o'clock.



THURSDAY, 10 o'clock A. M., January 14, 1841.

The House assembled pursuant to adjournment.

In pursuance of notice, Mr. Clements called up for consideration the resolution offered by him yesterday, that the House go into committee of the whole on the message of the Governor, with a view to its reference to appropriate committees.

The said resolution was then read, and

On motion of Mr. Clements,

*Adopted.*

The House then resolved itself into a committee of the whole on the Governor's Message—Mr. Higgins in the chair.

After some time spent therein the committee rose and reported to the House that they recommended the appointment of committees on the part of the House on the following portions of His Excellency's Message, to wit:—

A committee of five members on so much thereof as relates to the subject of free schools.

A committee of five members on so much thereof as relates to the transcription of the pay and subsistence rolls of the old Delaware line in the Revolutionary war, now on file in the office of the Secretary of State; and the appointment of a State Librarian.

A committee of three members on that part which relates to the appointment and compensation of certain Judges ad litem.

A committee of three members on that portion which recommends the education at the public expense of the Indigent Deaf and Dumb of this State.

A committee of three members on so much thereof as relates to the appropriation of a fund to be at the disposal of the Governor, to be used in paying the expenses of the arrest, and the bringing into this State, of fugitives from justice.

A committee of three members on so much thereof as recommends the passage of resolutions in favor of a National Bank, and against the Sub-Treasury law.

A committee of three members on so much thereof as relates to the claim of our citizens on the General Government for indemnity against French Spoliations prior to 1800.

A committee of three members on that part which relates to the with-

holding of the fourth instalment of the Surplus Revenue of the United States.

A committee of three members on that part which relates to a further extension of the Franking Privilege to the Governors and Secretaries of the different States; and

A committee of five members on the subject of the exemption of certain property of poor persons from sale by creditors.

The committee also recommended that so much of the said message as relates to the subject of crimes and misdemeanors, be referred to the committee already appointed, to whom was referred the recommendation in said message, for the establishment of a Penitentiary System.

After which the committee asked to be discharged: and

On motion of Mr. Betts,

*Were discharged.*

On motion of Mr. Black,

The House then adjourned until 3 o'clock this afternoon.



*Eodem Die, 3 o'clock, P. M.*

The House met pursuant to adjournment.

In compliance with the recommendation of the committee of the whole, reported this morning,

The Speaker announced the following committees on those portions of the Governor's Message, designated, to wit:—

On so much thereof as relates to Free Schools, Messrs. Clements, Jefferson, Chamberlain, Dale and Waples.

On so much thereof as relates to the subject of Judges ad litem, Messrs. Clements, Betts and Wright.

On so much thereof as relates to the instruction of the indigent Deaf and Dumb, Messrs. Dale, Wilds and Hill.

On so much thereof as relates to the preservation of Revolutionary Papers, and the appointment of a State Librarian, Messrs. Clements, Black, Barr, Johnson and Marshall.

On so much thereof as relates to fugitives from justice, and the compensation to agents employed for their arrest and removal to this State, Messrs. Huffington, Chamberlain and Sudler.

On so much thereof as relates to the subject of the establishment of a National Bank, and the repeal of the Sub-Treasury System, Messrs. Barr, Frazer and Jefferson.

On so much thereof as relates to the claim of citizens of this State, on the General Government for French Spoliations, prior to 1800, Messrs. Betts, Virden and Wright.

On so much thereof as relates to the withholding of the fourth instalment of the Surplus Revenue, Messrs. Johnson, Black and Hill.

On so much thereof as relates to the extension of the Franking Privilege, Messrs. Wright, Virden and Higgins.

On so much thereof as relates to the exemption of certain property of poor persons from sale by creditors, Messrs. Higgins, Chamberlain and Wilds.

The House then in accordance with the recommendation of the Committee of the Whole, directed that portion of the message relating to the revision of the penal code, to be referred to the committee heretofore raised on the subject of the establishment of a Penitentiary System in this State.

In pursuance of notice given yesterday, Mr. Betts asked, and

On motion of Mr. Wright,

Obtained leave to introduce a bill entitled "A further supplement to the act entitled 'An act providing for the punishment of certain crimes and misdemeanors.'"

On motion of Mr. Betts,

The said bill was read.

On motion of Mr. Huffington,

Fifty copies of said bill were ordered to be printed.

Mr. Chamberlain in pursuance of notice given yesterday, asked, and

On motion of Mr. Wright,

Obtained leave to introduce a bill entitled "An act to amend the act entitled 'An act empowering the Orphans' Court to direct the sale of the real estate of minors.'"

On motion of Mr. Chamberlain,

The said bill was read.

At the request of Mr. Huffington, the said bill was then laid on the table until Monday next.

Mr. Betts gave notice that he would to-morrow ask leave to introduce a bill entitled "An act in respect to insurance for lives, for the benefit of married women."

In pursuance of notice given yesterday, Mr. Chamberlain asked, and

On motion of Mr. Clements,

Obtained leave to introduce a bill entitled "A supplement to an act entitled 'An act laying a tax on dogs in New Castle county, passed at Dover, February 21st, one thousand eight hundred and thirty nine.'"

On motion of Mr. Chamberlain,

Said bill was read.

On motion of Mr. Johnson,  
The bill entitled "An act to divorce Elender McGee and Edward McGee from the bonds of matrimony," was read a second time.

Mr. Johnson then offered an amendment to the said bill, which,

On his motion,  
Was read and adopted, viz:—

Amend the bill by inserting in the enacting clause, in the second line of the first section, between the word "Representatives," and the word "in," the words "of the State of Delaware."

Mr. Betts gave notice that he would to-morrow ask leave to introduce a supplement to the law regulating tavern-keepers, &c. in this State.

On motion of Mr. Sudler,

The bill entitled "An act to enable James Scott to locate certain vacant land in Broad Creek hundred, Sussex county, and to complete his title to the same," was read a second time.

Mr. Wright presented the petition of Wingate Downs, of Sussex county, praying the Legislature to pass a law to authorize him to locate certain vacant land therein mentioned.

On his motion,

The said petition was read and referred to a committee of three members with leave to report by bill or otherwise.

That committee consists of Messrs. Wright, Collins and Dale.

Mr. Marshall laid on the table the affidavit of Thomas Coffin of Milton, Sussex county, in the case of the application of Foster Donovan for a divorce from his wife Avis.

On motion of Mr. Dale,  
The affidavit was read.

On motion of Mr. Marshall,

The bill entitled "An act to repeal so much of the act entitled 'An act supplementary to an act for the protection of certain shell fisheries in the State,' was read a second time.

On motion of Mr. Virden,

The bill entitled "An additional supplement to the act entitled 'An act to extend time for recording of deeds,' was read a second time.

On motion of Mr. Huffington,

The bill entitled "An act to divorce Foster Donovan and his wife Avis Donovan from the bonds of matrimony," was read a second time.

On motion of Mr. Black,

The bill entitled "An act to enable Josiah Carey to locate certain vacant lands situate in Baltimore hundred, Sussex county, State of Delaware, and to complete his title to the same," was read a second time.

On motion of Mr. Wright,

The House then adjourned until to-morrow morning at 10 o'clock.

FRIDAY, 10 o'clock, A. M. January 15, 1841.

The House assembled pursuant to adjournment.

In pursuance of notice given yesterday,

Mr. Huffington asked, and

On motion of Mr. Wright,

Obtained leave to introduce a bill entitled "An act to repeal the act entitled 'An additional supplement to the act entitled An act providing for the punishment of certain crimes and misdemeanors.'"

On motion of Mr. Huffington,  
The said bill was read.

In pursuance of notice given yesterday,

Mr. Betts asked, and

On motion of Mr. Huffington,

Obtained leave to introduce a bill entitled "An act in respect to insurance for lives, for the benefit of married women."

On motion of Mr. Betts,  
The said bill was read.  
And

On motion of Mr. Huffington,  
Fifty copies of said bill were ordered to be printed.

Mr. Betts, in pursuance of notice also given yesterday, asked, and

On motion of Mr. Wright,

Obtained leave to introduce a bill entitled "An additional supplement to the act entitled 'An act for regulating innholders, tavern keepers, and other public house keepers within this government, and empowering the justices to settle the rates of liquor.'"

On motion of Mr. Betts,  
The said bill was read.

On motion of Mr. Sudler,

The bill entitled "An act to enable James Scott to locate certain vacant land in Broad Creek hundred, Sussex county, and to complete his title to the same," was read a third time by paragraphs and

*Passed the House.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Virden,

The bill entitled "An additional supplement to the act entitled 'An act to extend the time for recording of deeds,'" was read a third time by paragraphs and

*Passed the House.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Betts,

The bill entitled "A further supplement to the act entitled 'An act providing for the punishment of certain crimes and misdemeanors,'" was read a second time.

On motion of Mr. Barr,

The following bills, heretofore reported by the committee on unfinished business, were taken up and read, to wit:—

"An act prohibiting the construction and use of certain traps in the county of Sussex."

Also "An act to encourage the raising of sheep."

Also "An act to amend the act entitled 'An act providing for the recovery of small debts.'"

On motion of Mr. Huffington,

Two of the said bills, to wit:—

The bill entitled "An act to encourage the raising of sheep," and

The bill entitled "An act prohibiting the construction and use of certain traps in the county of Sussex," were taken up for consideration.

On his motion,

The said bills were then

*Indefinitely postponed.*

Mr. Dale presented the petition of William Cleaver, of New Castle county, praying the Legislature to grant him all that portion of Reedy Island, in the river Delaware, not heretofore ceded to the government.

On motion of Mr. Dale,

The said petition was read and referred to Messrs. Dale, Johnson and Marshall, with leave to report by bill or otherwise.

On motion of Mr. Sudler,

The House then adjourned until three o'clock this afternoon.



*Eodem Die, 3 o'clock, P. M.*

The House met pursuant to adjournment.

On motion of Mr. Barr,

The bill heretofore reported by the committee on unfinished business, entitled "An act to provide for the reformation of the system of free schools," was taken up for consideration.

On his motion,

The said bill was then

*Indefinitely postponed.*

On motion of Mr. Black,

The bill entitled "An act to enable Josiah Carey to locate certain vacant land situate in Baltimore hundred, Sussex county, State of Delaware, and to complete his title to the same," was read a third time by paragraphs and

*Passed the House.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Johnson,

The bill entitled "An act to divorce Elen'der M'Gee and Edward M'Gee from the bonds of matrimony," was read a third time by paragraphs and

*Passed the House.*

*Ordered* to be returned to the Senate.

On motion of Mr. Wright,

The House then adjourned until to-morrow morning at 10 o'clock.



SATURDAY, 10 o'clock A. M., January 16, 1841.

The House assembled pursuant to adjournment.

Mr. Black laid on the table the following resolution, which

On his motion,  
Was read, to wit:—

*Resolved by the House of Representatives of the State of Delaware, by and with the concurrence of the Senate,* That  
be, and he is hereby appointed State Treasurer.

Mr. Black then gave notice that he would on Tuesday next call up the above resolution, with a view to filling the blank and to its adoption.

Mr. Clements laid on the table the following resolution, which

On his motion,  
Was read, to wit:—

*Resolved,* That the custom of holding balls in the Hall of the House of Representatives, *is* (to say the least of it) of doubtful expediency, and should not be continued.

Mr. Frazer laid on the table the following joint resolutions, which,

On his motion,  
Were read, to wit:—

*Resolved by the Senate and House of Representatives of the State of Delaware in General Assembly met,* That a committee of five mem-

bers, two on the part of the Senate and three on the part of the House of Representatives be appointed to wait on the Governor elect, and inform him that the two Houses will assemble in the Court-room on Tuesday the 19th instant at 12 o'clock M. and attend him while he takes the oaths of office, as prescribed by the Constitution of this State and of the United States, and to request the attendance of the Governor.

*Resolved further*, That the Hon. Samuel M. Harrington be invited to attend for the purpose of administering the oaths of office to the Governor elect.

On motion of Mr. Huffington,  
The said resolutions were then

*Adopted.*

And Messrs. Frazer, Barr and Jefferson, were appointed the committee on the part of the House.

*Ordered* to the Senate for concurrence.

Mr. Barr, chairman of the committee to whom was referred so much of the Governor's message as relates to the distribution of the proceeds of the sales of the public lands among the States, made the following report which,

On motion of Mr. Huffington,  
Was read, to wit:—

The committee to whom was referred so much of the Governor's message as relates to the distribution of the proceeds of the sales of the public lands among the several States, &c.,

*Report*, That the citizens of this State consider the public lands, as an inheritance purchased by the toil, sufferings, blood and treasure of our revolutionary fathers, and bequeathed to their successors, in which the people of all the States have an equal right; and that their interest therein is of too much value and too highly appreciated by them to be relinquished without an adequate equivalent: that they view with deep solicitude the continual efforts in the National Legislature to deprive the original States of their just and equitable rights in the public lands, by either ceding them to the new States or disposing of them at prices merely nominal. That the people of Delaware look forward with anxiety, but not without hope, to the time when the revenue arising from the sales of the public lands shall be distributed among the States generally according to their population, and applied to the purposes of education; thereby promoting the general welfare, by giving safety and permanence to our free institutions, the best security of which will always be found in the knowledge and intelligence of the people. Your committee therefore recommend the adoption of the following resolutions:

*Resolved by the Senate and House of Representatives of the State of Delaware in General Assembly met*, That this Legislature views with a jealous eye every attempt to make a partial distribution of the proceeds of the public lands of the Union among the States, whether by a direct

grant to a State, or by sales at prices far below their value to the citizens thereof.

*Resolved*, That the proceeds of the sales of the public domain should be entirely separated from the general revenue and distributed among the several States according to their population, to be by them applied to the purposes of education.

*Resolved*, That we consider the public lands as the common property of all the States, and therefore solemnly protest against any partial distribution of the proceeds thereof.

*Resolved*, That our Senators in Congress be instructed, and our Representatives in Congress be requested, to make use of their best efforts to procure the passage of a law for the distribution of the proceeds of the public lands among the several States, to be appropriated by them, so as to promote the the cause of general education.

*Resolved*, That the foregoing report and resolutions be signed by the Speaker of the Senate and by the Speaker of the House of Representatives, and that a copy be transmitted to each of our Senators and our Representative in Congress, to be laid before their respective Houses; and that the Executive of each State be furnished with a copy by the Governor of this State, and requested to lay the same before their respective Legislatures.

On motion of Mr. Clements,  
The reports and resolutions were then

*Adopted.*

*Ordered* to the Senate for concurrence.

Mr. Fisher, Clerk of the Senate, being admitted, presented for the concurrence of the House a bill entitled "An act to enable John Watkins to locate certain vacant land in North West Fork hundred in Sussex county, and to complete his title to the same," with its accompany petition.

And he withdrew.

On motion of Mr. Clements,  
The said bill was read.

Mr. Huffington gave notice that he would, on Monday next, ask leave to introduce a bill entitled "An act to amend the act entitled 'An act for ascertaining the salaries of the Governor, Chancellor, Judges and the Secretary, and for making allowances to the members of the General Assembly, and for other purposes.'"

On motion of Mr. Clements,  
The bill entitled "An act to amend the act entitled 'An act providing for the recovery of small debts,'" was read a second time by its title.

On his motion,  
The said bill was then read a third time by special order by paragraphs and

*Passed the House.*

*Ordered* to the Senate for concurrence.

Mr. Wright laid on the table the following joint resolution, which

On his motion,  
Was read, to wit:—

*Resolved by the Senate and House of Representatives of the State of Delaware in General Assembly met,* That when the two Houses adjourn on Wednesday next, they will adjourn over to Tuesday the 26th instant.

On motion of Mr. Betts,

The bill entitled “A supplement to the act entitled ‘An act to enable the owners and possessors of the meadow, marsh and cripple, lying on both sides of the Northwest Branch of Duck Creek, emptying into the main branch of Duck Creek, below the Eagle’s Nest Landing, effectually to embank and drain the same, and keep the banks, dams, sluices, canals and drains in repair, and to raise a fund to defray the expense thereof,” was read a second time.

Mr. Barr gave notice that he would, on Tuesday next, call up the resolution by him offered heretofore for the appointment of an Auditor of Accounts in order to the filling of the blank therein, and to its adoption by the House.

Mr. Black moved,  
That the eighth rule of the House be suspended in order that he might introduce a bill,  
Which motion

*Prevailed.*

He then asked, and

On motion of Mr. Clements,  
Obtained leave to introduce a bill entitled “An additional supplement to the act entitled ‘An act to amend the act entitled An act concerning the constitution of the Levy Court and Court of Appeal.”

On motion of Mr. Dale,  
The said bill was read.

On motion of Mr. Huffington,  
The bill entitled “An act to repeal the act entitled ‘An additional supplement to the act providing for the punishment of certain crimes and misdemeanors,” was read a second time.

On motion of Mr. Betts,  
The bill entitled “An act in respect to insurance for lives, for the benefit of married women,” was read a second time.

On motion of Mr. Huffington,  
The House then adjourned until Monday morning next, at 10 o’clock.

MONDAY, 10 o'clock, A. M., January 18, 1841.

The House convened pursuant to adjournment.

Mr. Wright laid on the table the following preamble and joint resolutions, which,

On his motion,  
Were read, to wit:—

*Whereas*, it hath been represented to this General Assembly, that the tomb heretofore erected by order of the Legislature of this State in the grave-yard of the first Presbyterian church in the City of Philadelphia, over the remains of Col. John Haslet, commander of the Delaware regiment in the revolutionary war, who fell in 1777, at the battle of Princeton, is now in a wretched and ruinous condition, *And whereas*, the General Assembly entertains in common with the citizens of this State, a great regard for the memory of a brave and patriotic citizen who died gallantly fighting under the banners of Washington, in defence of the liberties of his country, desire to preserve and cherish that memory, by procuring the removal of his remains to be deposited within the limits of this State. Therefore,

*Be it Resolved by the Senate and House of Representatives of the State of Delaware in General Assembly met*, That a committee be appointed, to consist of two on the part of the House and one on the part of the Senate, whose duty it shall be to proceed forthwith to Philadelphia, and bring his remains from their present depository and place them in some fitting and desirable spot within the limits of this State, as they or a majority of them shall determine; and to have a suitable monument with appropriate inscriptions and devices, prepared by a skilful artist and erected under their superintendence and direction, over his remains when so deposited.

*Resolved*, That the committee appointed by the foregoing resolutions or a majority of them are hereby authorized to draw their orders on the State Treasurer for any sum or sums not exceeding in the whole the sum of \_\_\_\_\_ dollars, for the purpose of carrying into effect the object of the resolutions aforesaid, and the State Treasurer, be and he is hereby authorized and directed to pay the orders of the said committee so drawn on him out of any money in the treasury not otherwise appropriated, and it shall be the duty of the said committee or a majority of them to make report of their proceedings in the premises to the next biennial Session of the Legislature, setting forth the expenditures consequent upon the execution of their duties under the provisions of this resolution.

On motion of Mr. Higgins,

The blank in the said resolutions was filled with the words "one thousand."

On his motion also,  
The preamble and resolutions were then adopted.

And the Speaker announced as the Committee on the part of the House Messrs. Wright and Huffington.

*Ordered* to the Senate for concurrence.

Mr. Huffington laid on the table the following joint resolution, which,

On his motion,  
Was read, to wit:—

*Resolved by the Senate and House of Representatives of the State of Delaware, in General Assembly met,* That

is hereby authorised to purchase for the use of the members of the House of Representatives, twenty-one chairs and twenty desks, the cost of which shall not exceed two hundred dollars, which sum the State Treasurer is hereby authorised and directed to pay on his order.

Mr. Huffington, in pursuance of notice given last week, asked, and,

On motion of Mr. Clements,

Obtained leave to introduce a bill entitled "An act to amend the act entitled 'An act for ascertaining the salaries of the Governor, the Chancellor, the Judges and the Secretary, and for making allowances to the members of the General Assembly and for other purposes, and also to amend the act entitled 'An act to carry into effect the amended constitution and for other purposes.'"

On motion of Mr. Huffington,

The said bill was read.

Mr. Betts presented the claim of David L. Moody for arresting and taking to Dover from the city of Wilmington, Henry J. Clark, which,

On his motion,  
Was read and referred to the committee of claims.

Mr. Huffington gave notice that he would to-morrow ask leave to bring in a bill entitled "An act to amend the act entitled 'An act concerning certain crimes and offences committed by slaves, and for the security of slaves properly demeaning themselves.'"

Mr. Clements presented the claim of John H. Eccleston against the State for his attendance as Clerk upon the Court of Errors and Appeals, &c., which,

On his motion.  
Was read and referred to a committee on claims.

Mr. Betts presented the petition of the Washington Beneficial Society of Wilmington, praying the Legislature for a renewal of its charter, which,

On his motion,  
Was read and referred to Messrs. Betts, Virden and Waples, with leave to report by bill or otherwise.

Mr. Huffington gave notice that he would to-morrow ask leave to introduce a bill entitled "An act to amend the act entitled 'An act concerning

the keeping of the papers belonging to the Executive department, and the acts of the General Assembly, and the printing and disposal of the laws and journals."

Mr. Betts, from the committee on so much of the Governor's Message as relates to the subject of French spoliations, asked, on behalf of the committee, for further time to report.

On motion of Mr. Huffington,  
Leave was granted.

On motion of Mr. Huffington,  
The bill entitled "An act to divorce Foster Donovan and his wife, Avis Donovan, from the bonds of matrimony," was read a third time by paragraphs, and

*Passed the House.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Chamberlain,  
The bill entitled "An act to amend the act entitled 'An act empowering the Orphans' Court to direct the sale of the real estate of minors,'" was read a second time.

Mr. Wright, chairman of the committee to whom was referred the petition of Wingate Downs, reported a bill entitled "An act to enable Wingate Downs to locate certain vacant land in Broad creek hundred, in Sussex county, and to complete his title to the same," which,

On his motion,  
Was read.

Mr. Clements, chairman of the committee appointed on that portion of the Governor's Message, which relates to the subject of the appointment and compensation of certain Judges ad litem, asked leave on behalf of the committee for further time to report.

On motion of Mr. Higgins,  
Leave was granted.

On motion of Mr. Betts,  
The bill entitled "A supplement to the act entitled 'An act to enable the owners and possessors of the meadow, marsh and cripple, lying on both sides of the North West Branch of Duck Creek, emptying into the main branch of Duck Creek below the Eagles' Nest Landing, effectually to embank and drain the same, and keep the banks, dams, sluices, canals and drains in repair, and to raise a fund to defray the expense thereof,'" was taken up for a third reading, and read by paragraphs.

On the question of the final passage of said bill, it being one which required the vote of two-thirds of each branch of the General Assembly,

Mr. Betts requested that the yeas and nays might be taken,  
Which was done,  
And they are as follows, viz:—

*Yeas.*—Messrs. Barr, Betts, Black, Chamberlain, Clements, Collins,

Dale, Frazer, Higgins, Hill, Huffington, Jefferson, Johnson, Virden, Waples, Wright, and Mr. Speaker—17.

*Nays.*—None.

So the said bill

*Passed unanimously.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Betts,

The bill entitled “A further supplement to the act entitled ‘An act providing for the punishment of certain crimes and misdemeanors,’” was read a third time by paragraphs, and

*Passed the House.*

*Ordered* to the Senate for concurrence.

Mr. Wright presented the petition of Peter Parker, Senior, Register of Wills of Sussex county, praying the Legislature to authorise him to procure a new seal of office, which,

On his motion,

Was read and referred to Messrs. Wright, Collins and Black, with leave to report by bill or otherwise.

On motion of Mr. Higgins,

The House then adjourned until three o'clock this afternoon.



*Eodem Die, 3 o'clock, P. M.*

The House met pursuant to adjournment.

Mr. Barr, chairman of the committee to whom was referred so much of the Governor's Message as relates to the controversy between the Governors of the States of Virginia and New York, upon the subject of the refusal by the Governor of New York to deliver up to the Governor of Virginia upon his requisition, certain fugitives from justice, made the following report, which

On his motion,

Was read, to wit:—

The committee to whom was referred so much of the Governor's Message as relates to the controversy between the States of Virginia and New York, in relation to the refusal of the Governor of New York to deliver certain fugitives from justice upon the demand of the State of Virginia,

*Report,* That they view with deep and anxious interest every difficulty between sister States, calculated to disturb the harmony and good feel-

ing which should ever exist between the members of the great national family of the Union. That whatever may be our individual opinions as to the abstract right to hold slaves, we cannot lose sight of the fact that that right is guaranteed to the slave holder by express provision in the Constitution of the United States, in the following words: "No person held to service or labor in one State, under the laws thereof, escaping into another, shall in consequence of any law or regulation therein, be discharged from such service or labor, but shall be delivered up, on claim of the party to whom such service or labor may be due."—Con. U. S. Art, 4 Sec. 2. That in the language of the Constitution of the United States, that instrument was formed and adopted for the purpose of forming a more perfect union, establishing justice, ensuring domestic tranquility, providing for the common defence, promoting the general welfare, and securing the blessings of liberty to ourselves and posterity; that to give full force and effect to the ends thus proposed, it becomes not only the duty, but the interest of every State, to regard with scrupulous tenacity the provisions of the national constitution, even should they come in conflict with popular prejudice, or pre-conceived opinions. For these and other obvious reasons, your committee recommend the adoption of the following resolutions:—

*Resolved by the Senate and House of Representatives of the State of Delaware in General Assembly met,* That the reasons assigned by the Governor of New York, for his refusal to surrender Peter Johnson, Edward Smith, and Isaac Gansey, as fugitives from justice, upon the demand of the Executive of Virginia, are deemed by this Legislature unsatisfactory, and not in accordance with the letter and spirit of the Constitution of the United States, but in derogation thereto.

*Resolved,* That while we deprecate the resort by the State of Virginia to extreme measures for redress, such as are calculated to disturb the peace and harmony of the Union, we cannot but admit the justice of her appeal against the course pursued by the Governor of New York, and that this State joins in the request of Virginia to the Executive of New York, that he review his course and ultimately act in accordance with the rights secured to the slave holding States, under the wise and salutary provisions of our great national compact.

*Resolved,* That the Governor of Delaware, be requested to forward copies of these resolutions to the Executive of the States of Virginia and New York, with the request that they be laid before their respective legislatures.

On motion of Mr. Huffington,  
The said report and resolutions were

*Adopted.*

*Ordered* to the Senate for concurrence.

Mr. Huffington presented the petition of Esther Coverdill, the wife of David B. Coverdill, praying the Legislature to pass a law authorizing her to hold property in her own right, notwithstanding her coverture, which should not be liable for the debts of her said husband.

On motion of Mr. Huffington,

The petition was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Huffington, Higgins and Hill.

Mr. Clements, chairman of the committee to whom was referred so much of the Governor's Message as relates to the subject of free schools, and also on so much of the Governor's Message as relates to the transcription of the revolutionary pay and subsistence rolls, and the care of the public library, asked on behalf of those committees respectively, for further time to report.

On motion of Mr. Huffington,

Leave was granted.

Mr. Dale, chairman of the committee to whom was referred the petition of William Cleaver, praying the Legislature for a grant of that part of Reedy Island, in the river Delaware, not at present occupied, reported a bill entitled "An act granting to William Cleaver, jr. of New Castle county, a certain tract or parcel of waste and uncultivated land therein described," which

On his motion,  
Was read.

Mr. Clements presented the claim against the State of Joseph Buckmaster, for his attendance as crier on the Court of Errors and Appeals, &c., which

On his motion,  
Was read and referred to the committee of claims.

On motion of Mr. Huffington,  
The bill entitled "An act to regulate the institution and drawing of lotteries, and the sale of lottery tickets within this State," was read a third time by paragraphs and

*Passed the House.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Johnson,  
The House then adjourned until to-morrow morning at 10 o'clock.



TUESDAY, 10 o'clock A. M., January 19, 1841.

The House assembled pursuant to adjournment.

Mr. Huffington chairman of the committee to whom was referred the

petition of Esther Coverdill, presented yesterday, reported a bill entitled "An act for the relief of Esther Coverdill," which,

On his motion,  
Was read.

Mr. Higgins presented the petition of sundry citizens of New Castle county, praying the Legislature for the repeal of an act passed at the last Session of the General Assembly laying a tax on dogs in New Castle county.

On motion of Mr. Higgins,  
The said petition was read.

Mr. Betts presented the petition of the Union Bank of Delaware, praying the Legislature for a supplement to its charter, so as to enable it to fill vacancies which may occur in its Board of Directors.

On motion of Mr. Betts,  
The said petition was read and referred to a committee of three members with leave to report by bill or otherwise.

That committee consists of Messrs. Betts, Wilds and Sudler

On motion of Mr. Dale,  
The bill entitled "An act granting to William Cleaver of New Castle county, a certain tract or parcel of waste and uncultivated land therein described," was read a second time.

On motion of Mr. Dale,  
The blanks in the said bill were filled with the words "seventy-five."

Mr. Fisher, Clerk of the Senate, being admitted, informed the House that the Senate had concurred in the passage of the joint resolutions appointing a committee to wait on the Governor elect, and had appointed Messrs. Spruance and Tharp the committee on the part of the Senate.

Also in the passage of the joint resolutions on the subject of the Public Lands.

And in the amendment proposed by the House to the bill from the Senate, entitled "An act to divorce Ellender M'Gee and her husband Edward M Gee, from the bonds of matrimony."

And he withdrew.

Mr. Barr, from the committee to whom was referred so much of the Governor's Message as relates to the establishment of a National Bank, asked leave on behalf of the said committee for further time to report.

On motion of Mr. Higgins,  
Leave was granted.

Mr. Betts, presented the petition of the Fame Hose Company of Wilmington, praying the Legislature for an act of incorporation, which

On his motion,  
Was read and referred to Messrs. Betts, Marshall and Johnson, with leave to report by bill or otherwise.

Mr. Johnson, chairman of the committee on so much of the Governor's

Message as relates to the withholding of the fourth instalment of the surplus revenue of the United States, asked leave on behalf of said committee for further time to report.

On motion of Mr. Clements,  
Leave was granted.

In pursuance of notice,  
Mr. Huffington asked, and

On motion of Mr. Higgins,  
Obtained leave to introduce a bill entitled "An act to amend the act entitled "An act concerning the keeping of the papers belonging to the Executive Department, and the acts of the General Assembly, and the printing and disposal of the Laws and Journals."

On motion of Mr. Huffington,  
The said bill was read.

Mr. Betts gave notice that he would to-morrow ask leave to introduce a bill to amend the General Election Law.

On motion of Mr. Chamberlain,  
The bill entitled "A supplement to an act entitled 'An act laying a tax on dogs in New Castle county, passed at Dover, February 21st, one thousand eight hundred and thirty-nine,'" was read a second time.

On motion of Mr. Black,  
The bill entitled "An additional supplement to the act entitled 'An act to amend the act entitled 'An act concerning the constitution of the Levy Court and Court of Appeal,'" was read a second time.

Mr. Fisher, Clerk of the Senate, being admitted, informed the House that the Senate had concurred in the passage of the bill entitled "An act to enable James Scott to locate certain vacant land in Broad Creek hundred, Sussex county, and to complete his title to the same."

And he withdrew.

Mr. Betts presented the petition of sundry citizens of New Castle county, praying the Legislature to abolish imprisonment for debt, which,

On his motion,  
Was read and referred to the committee already raised on that subject.

Mr. Wright presented the claim against the State, of Jacob Helms of Sussex county, praying the Legislature to compensate him for his services as an adjutant in the militia of the State from the year 1800, to the year 1815.

On motion of Mr. Wright,  
The said claim was read, and

On motion of Mr. Clements,  
Was laid on the table.

Mr. Fisher, Clerk of the Senate, being admitted, informed the House that the Senate had concurred in the passage of the bill entitled "An act

to enable Josiah Carey to locate certain vacant lands situate in Baltimore hundred, Sussex county, State of Delaware, and to complete his title to the same."

And he withdrew.

Mr. Dale, chairman of the committee to whom was referred so much of the Governor's Message as relates to the instruction, at the public expense, of the indigent deaf and dumb of this State, asked leave, on behalf of said committee, for further time to report.

On motion of Mr. Clements,  
Leave was granted.

On motion of Mr. Betts,  
The bill entitled "An act in respect to insurance for lives, for the benefit of married women," was read a third time by paragraphs, and

*Passed the House.*

*Ordered* to the Senate for concurrence.

Mr. Fisher, Clerk of the Senate, being admitted, presented for concurrence a bill which had passed the Senate, entitled "A supplement to the act entitled 'An act to enable Amanda Green, Jane Green, and Charles Green, minors, to sell and convey certain real estate therein mentioned.'" And he withdrew.

On motion of Mr. Higgins,  
The said bill was read.

Mr. Wright presented the petition of Eli Layton, of Sussex county, praying the passage of a law to enable him to locate certain vacant land therein mentioned, which,

On his motion,  
Was read and referred to Messrs. Wright, Chamberlain and Collins, with leave to report by bill or otherwise.

On motion of Mr. Dale,  
The bill entitled "An act to amend the supplement passed January 25, 1830, to the act for the establishment of free schools," was read a second time.

On motion of Mr. Huffington,  
*Ordered*, that the Clerk do proceed to the Senate Chamber and inform the Senate that the members of the House are ready to meet them, that the two Houses may proceed together to the Court-room to witness the inauguration of William B. Cooper, the Governor elect.

Which was done.

Mr. Fisher, Clerk of the Senate, being admitted, informed the House that the Senate were ready to meet the members of the House of Representatives, in order to proceed to the Court-room to be present at the inauguration of the Governor.

Whereupon,

The two Houses jointly proceeded to the Court room, and took the seats prepared for their reception.

The General Assembly being thus convened, the Governor elect, attended by the joint committee, his Excellency the Governor, and the Hon. Samuel M. Harrington, entered the Court-room, and took the seat prepared for his accommodation.

On motion of Mr. Spruance,

The resolution for convening the two Houses was read.

Judge Harrington then administered the following oaths of office to the Governor elect, to wit:—

I, William B. Cooper, do solemnly swear on the Holy Evangels of Almighty God, that I will support the Constitution of the United States of America. So help me God.

I, William B. Cooper, do solemnly swear on the Holy Evangels of Almighty God, that I will support the Constitution of the State of Delaware, and perform the duties of the office of Governor of the State of Delaware with fidelity. So help me God.

The Governor then delivered the following inaugural address to both Houses of the General Assembly, to wit:—

*Fellow-citizens of the Senate,  
and of the House of Representatives:—*

Called by the free suffrages of the people to the dignified and important office of Chief Executive Magistrate of our beloved State, I enter upon the discharge of its duties, with a deep sense of the high responsibility which it imposes.

Let my first act in office be to acknowledge publicly, as I now most humbly do, that for the proper performance of these duties, my chief reliance is upon the assistance of that Almighty Being who rules the destinies of men. Conscious of my inexperience in the duties of Executive administration, it is my most fervent supplication and my greatest trust, that in all my actions as the chief servant of the people of this State, I may be enlightened and directed by His wisdom, and that my deficiencies may be supplied by His aid.

By the Constitution of the State of Delaware the duty is enjoined upon the Governor of recommending from time to time for your consideration, such measures as he may deem expedient. In the discharge of this duty it may be profitable to review some of the leading features of that system of State policy, which our predecessors have established. One of the long cherished principles of this policy has been, never to put the State in the condition of a debtor, beyond her own available resources. We have never known what a State debt is, from any experience of our own. We have refused to embark in any scheme of internal improvement which should render it necessary to anticipate the resources of those who are to succeed us. We have an available surplus, amounting to more than half a million of dollars, and we owe not a dollar which we

cannot pay on demand. We have collected but one small State tax since the adoption of our Amended Constitution; and it is probable, that with ordinary prudence we may never find it necessary to impose another, unless war should visit our country.

Within a few years past other States, influenced by the phrenzied excitement of the times, have incurred debts to a very large amount, the payment of which, must cause an oppressive draft for a long series of years, upon the productive industry and resources of the country. I recommend, Gentlemen, a steady adherence to our old fashioned policy. We may not obtain by it in the judgment of some, that high character for enterprise, which others have claimed as a great merit; but if we do not abandon it, we shall be free from debt, and have the satisfaction of knowing that the fruits of our labor will be all our own; and we shall enjoy our homes and their comforts the better, when we reflect that our children will be left unincumbered and as independent, as our fathers who adopted this policy have left us.

Another distinguishing characteristic in our State policy is, to avoid excess in the banking system. During the last eight years, many of our sister States have greatly exceeded the limits which prudence and reason would have prescribed in this respect. Fortunately for us, the men who have controlled in the councils of Delaware during that period, had learned wisdom from the history of the past. We have a banking capital of about a million and a half of dollars, which experience has shown to be sufficient for all the necessary purposes of State banking among us. Our Legislature has generally refused to follow the lead of others, who plunged into the worst excesses of banking, as soon as it was ascertained that the charter of the late National Bank had fallen under the Executive axe, in eighteen hundred and thirty-two.

By an official report of the Secretary of the Treasury of the 9th of April last, it appears, that on the first day of January, eighteen hundred and thirty, the aggregate number of State Banks was three hundred and thirty, with a capital of one hundred and forty five millions, one hundred and ninety-two thousand two hundred and sixty-eight dollars; and that on the first day of January, eighteen hundred and forty, the number of State Banks and branches had increased to nine hundred and one, with a capital of three hundred and fifty-eight millions, four hundred and twelve thousand six hundred and ninety-two dollars. It is estimated that the number of these banks and branches, now scarcely fall short of a thousand, with a capital of nearly four hundred millions of dollars.

The amount of bank capital in the United States on the first day of January, eighteen hundred and twenty, was one hundred and thirty-seven millions, one hundred and ten thousand six hundred and eleven dollars; and in the next succeeding ten years it increased only eight millions, eighty-one thousand six hundred and fifty-seven dollars; while the increase in the eight years succeeding the bank veto of eighteen hundred and thirty-two, appears to have been more than one hundred and ninety millions of dollars, nearly twenty-five times the increase that was made during the corresponding period, immediately preceding that exercise of executive power. The bank discounts on the first day of January, one

thousand eight hundred and thirty, was two hundred millions, four hundred and fifty-one thousand two hundred and eleven dollars, with a circulation of sixty-one millions, three hundred and twenty three thousand eight hundred and eight dollars. In the ten years immediately succeeding that period, the bank discounts had increased two hundred and sixty-two millions, four hundred and forty-five thousand three hundred and twelve dollars, with an increase in the circulating medium of forty-five millions, six hundred and twenty-four thousand seven hundred and sixty-four dollars. It is unnecessary to attempt here to describe the overtrading and speculation, or the ultimate disaster and distress growing out of this state of things. This great increase of bank capital, and the unprecedented increase of their loans and discounts, was unquestionably made chiefly under the impression of a necessity to supply a supposed vacuum in the circulating medium, caused by the destruction of the National Bank. In the four years subsequent to the first day of January eighteen hundred and thirty-six, the increase in the banking capital was one hundred and six millions, five hundred and forty thousand and four hundred dollars; exceeding the whole banking capital of the United States in eighteen hundred and sixteen, twenty-five millions, seven hundred and twenty-five thousand one hundred and seventy-eight dollars.

My purpose is not to criminate the authors of this evil, but I entreat you to study well the causes which led to it, and the melancholy consequences which have flowed, and are yet to flow from it. Though we have already suffered much from a disordered currency and distracted exchanges, the end is not yet. It is a proud and just reflection for us that we have in no way contributed to bring about this condition of affairs; our increase of bank capital has been small, and has not exceeded the increasing wants of the business of the people. Indeed, from the origin of our State Government to the present day, Delaware has never chartered a bank which failed in the end to redeem every dollar of its emissions of paper, and repay to its stockholders the amount of their investments. In this respect, we have been more fortunate than many of our sister States. The experience of the past should admonish us all to be constantly on our guard against the never-ceasing temptation to increase the banking capital of the State.

When the first National Bank fell, in eighteen hundred and eleven, we were without the experience on this subject which we learned in sorrow, during the next ten years. During the five years which elapsed between the fall of that National Bank charter and the incorporation of another National Bank, in eighteen hundred and sixteen, the States doubled their bank capital; and, at that time, we added our modicum to increase the general trouble. We suffered the consequences, and then curtailed the amount of our capital by declining to recharter two banks incorporated in eighteen hundred and twelve, and eighteen hundred and thirteen, since which our policy has been steadily observed; and I am well persuaded, that upon our future adherence to it, as a cardinal principle in the government of the State, our welfare eminently depends.

There is another principle now firmly engrafted upon our State policy, and which I earnestly hope may never be abandoned. It is to encourage

and promote education among all classes of our citizens. Our system of free schools is in useful operation, but like every system of the same kind in other States, it has met with difficulties and embarrassments. My immediate predecessor in office, whose opportunities of information on this subject are much greater than my own, has considered it, and recommended to your consideration, such alterations and amendments as he deemed best calculated to improve and perfect the system; and therefore it is rendered unnecessary for me to make any other suggestions to you on that subject, further than to remark, that by the practical operation of the system its imperfections will be developed; for which, as they are made manifest, it will become the province of the Legislature, from time to time, by further enactments, to provide a suitable remedy.

It is and ought ever to be considered an essential principle in the policy of every well regulated State, steadily and impartially to execute the laws. Penal laws, in a government like ours, when unnecessarily severe, defeat themselves. No penal code is wise and well considered, which goes greatly beyond public opinion in severity.

So much of our criminal law as prescribes the punishment of death for the second offence of kidnapping, has been found by experience to defeat its own operation; the same is true of so much of that code as makes capital those burglaries, where the intent is not to perpetrate either murder, rape or arson. In some cases also, less than capital, the punishment prescribed, defeats the law by its severity; and in general, wherever the laws have gone greatly beyond public opinion in the measure of punishment, juries have perhaps too often taken the law into their own hands, and refused to convict. Whether any, and to what extent, further alterations are now necessary in the existing code of our criminal laws, it will be for the wisdom of the Legislature to determine.

I make these suggestions because I wish it to be distinctly understood, that I deem it absolutely necessary to the proper government of the State, that the execution of the laws should be steady and impartial; and that the administration of justice in the courts should not be subverted by an improper exercise of the pardoning power vested in the Executive. Nothing can be more unwarrantable or injurious, than the exercise by the Executive, of a dispensing power over the laws. The Constitution does not appoint the Executive the judge of the expediency of the laws, when it calls on him to execute them; it clothes him with no right to make a dead letter of a statute, because he does not approve it.

Finally, Gentlemen, let us never forget the duty of so administering our public affairs, that morality, virtue and religion shall be protected and promoted within our borders. Let our municipal laws have this object constantly in view; for it was by these means that our ancestors laid the foundation of their success, in the experiment of republican government. By the observance of this principle, which guided the fathers of the republic in building up our institutions, we may expect the continuance to our people of the blessings of Him, without whose favor all the efforts of man, whether in public or private life to obtain security and happiness, are fruitless and vain.

I should be wanting, Gentlemen, both in sentiments of gratitude and re-

spect, were I to omit this opportunity of returning you my thanks, for the very polite attentions which you have accorded to me on the present occasion. I therefore beg leave to tender to you, and through you, to my fellow-citizens of the State, my sincere acknowledgments for the partiality manifested towards me, and for the trust and confidence reposed in me.

Having thus communicated to you, gentlemen, my sentiments, as they have been awakened by the occasion which brings us together, I take my present leave, but not without resorting once more to the Benign Parent of the human race, in humble supplication, that as he has been pleased to favor us with opportunities for deliberation, so his divine blessing may be equally conspicuous in the enlarged views, the temperate consultations, and the wise measures that may be adopted by the Legislature: and that our labors may be always so directed as to advance the welfare and security of the State, and the individual happiness and prosperity of its citizens.

WILLIAM B. COOPER.

*Dover, January 19, 1841.*

On motion of Mr. Huffington,  
The journals of the joint meeting were read and compared.

On motion of Mr. Higgins,  
The two Houses then separated, and the members of the House of Representatives returned to their chamber.

On motion of Mr. Higgins,  
Five hundred copies of the inaugural address were ordered to be printed.

On motion of Mr. Virden,  
The House adjourned until to-morrow morning at 10 o'clock.



WEDNESDAY, 10 o'clock A. M., January 20, 1841.

The House assembled pursuant to adjournment.

Mr. Chamberlain presented the petition of Benjamin Whiteman and Stephen Doughton, praying the Legislature to pass an additional supplement to the act passed at the June Session, 1836, entitled "An act to enable William Inskeip, of New Castle county, to raise his mill-dam, and for other purposes therein mentioned."

On motion of Mr. Chamberlain,  
The said petition was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Chamberlain, Huffington, and Jefferson.

Mr. Black presented the petition of sundry citizens of New Castle county, praying the Legislature to repeal the charter of the Elk and Christiana Turnpike Company.

On motion of Mr. Black,

The said petition was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Black, Frazer and Hill, with leave to report by bill or otherwise.

Mr. Marshall presented the petition of sundry citizens of the town of Lewes, in the county of Sussex, praying the Legislature to pass a law to prohibit the sale of ardent spirits on the Sabbath day within this State.

On motion of Mr. Marshall,

The said petition was read and referred to a committee of five members, with leave to report by bill or otherwise.

That committee consists of Messrs. Marshall, Barr, Dale, Wilds and Clements.

In pursuance of notice given yesterday, Mr. Betts asked, and,

On motion of Mr. Clements,

Obtained leave to introduce a bill entitled "A further supplement to the act entitled "An act regulating the General Election," which,

On his motion,

Was read.

Mr. Waples presented the petition of John D. Rodney, Jacob Forsett, and sundry other citizens of Sussex county, praying the Legislature to pass an act to authorise the said Rodney and Forsett to erect a mill-dam on Bundick's Branch, in said county, which,

On his motion,

Was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Waples, Higgins and Virden.

Mr. Marshall presented the remonstrance of the widow and heirs of Daniel Burton, deceased, late of said county, against the prayer of said petition, which,

On his motion.

Was read and referred to the same committee.

The Speaker presented the remonstrance of Benjamin McIlvaine, of the county of Sussex, against the prayer of said petition.

And also a certificate from certain persons, also of that county, in relation to the matters alledged in the remonstrance of Benjamin McIlvaine.

Both of which last mentioned papers were,

On motion of Mr. Higgins,

Read and referred to the committee on the petition of Messrs. Rodney and Forsett.

On motion of Mr. Huffington,

The bill entitled "An act to prevent unnecessary imprisonment for the execution of judgments in civil cases," was taken up for consideration.

Mr. Huffington offered the following amendment, which,

On his motion,

Was read, to wit:—

Amend the said bill by inserting in the 6th line of the 2d section, at the end of the parenthesis therein and before the words "according to law," the words "and for the want of goods and chattels, and ending with the words."

On motion of Mr. Huffington,

The said amendment was

*Adopted.*

On his motion, also,

The said bill was laid on the table for amendment.

Mr. Fisher, Clerk of the Senate, being admitted, informed the House that the Senate had concurred in the passage of the bill entitled "An additional supplement to the act entitled 'An act to extend the time for recording of deeds.'"

And he withdrew.

Mr. Betts, chairman of the committee to whom was referred the petition of the Union Bank of Delaware, praying the Legislature for a supplement to its charter for the purposes mentioned therein, reported a bill entitled

"A supplement to the act entitled 'An act to incorporate the Union Bank of Delaware,'" which,

On his motion,

Was read.

The Speaker presented the petition of forty citizens of the town of Lewes, in Sussex county, praying the Legislature for an act to incorporate the Lewes Beneficial Society.

On motion of Mr. Wright,

The said petition was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Wright, Betts and Johnson.

On motion of Mr. Higgins,

The bill entitled "A supplement to the act entitled 'An act to enable Amanda Green, Jane Green and Charles Green, minors, to sell and convey certain real estate therein mentioned,'" was read a second time.

Mr. Wright, chairman of the committee to whom was referred the petition of Peter Parker, the Register of Wills of Sussex county, reported a bill entitled "An act to authorise the Register for the Probate of Wills and granting letters of administration, in and for Sussex county, to procure a new seal of office."

On motion of Mr. Black,  
The said bill was read.

The Speaker laid on the table a letter from the Honorable Willard Hall, the Superintendent of Free Schools in New Castle county, in which was enclosed his report to the Legislature.

On motion of Mr. Black,  
The same were read as follow, to wit:—

Wilmington, January 16, 1841.

*To the Honorable the Speaker of the House of  
Representatives of the State of Delaware:*

SIR—Be pleased to lay before the House the enclosed report.

Permit me to request, to save the labor of transcribing it, that when it is entered upon the journal, if such be the will of the House, it be sent to the Senate.

With great respect,  
Yours,  
WILLARD HALL.

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#### REPORT

*Of the Superintendent of Free Schools in New Castle county to the General Assembly, pursuant to the eighth section of the "Act for the establishment of Free Schools."*

There being no requirement of law, that school committees shall report to the superintendents the state of their districts, in this county no such reports have ever been made. School conventions for this county, open to all school committees and other delegates from school districts and friends of popular education, have been held annually in Wilmington, beginning the first Tuesday of Dec. 1836. It is the object of this report to present to the General Assembly matters suggested in these conventions, with such remarks as shall be deemed pertinent.

In 1838, the convention expressed the opinion, that the office of superintendent in each county should be made more efficient. By this increased efficiency was understood power to be given by law to the superintendents to require reports from the school committees, and to obtain information from districts where there were no school committees, and take such other steps, that they should be able to exhibit the true state of all the school districts within their county. To such an office, a salary must be annexed; for the service would be too burdensome to be expected without remuneration. Nothing was said in the convention in opposition, but some whose opinions were entitled to much weight, decisively disapproved the proposition. It has not since been renewed. If the powers of the office were enlarged, and a salary given, there might be something of an imposing appearance put upon paper, but in all probability it would be appearance only, without any benefit resulting to par-

ticular districts, or the general cause. There are some things that must have the fostering of public spirit, to give prosperity; among these are common schools; and it is believed, it will be the best care of them to exclude from the system all salary offices. The wasting of money for mere appearances is not the worst result from such offices; it is much worse to excite curiosity for appearances, and to lead the people to rest on them, and be satisfied that there is a flourishing state of things, because there are flourishing reports.

To determine any point in respect to our school system, either of its sufficiency or defectiveness, it is necessary to take a precise view of it; to understand accurately what it designs to do. There is error in looking to the *system* to do, what *the people* must do. The design of the system is not to make schools by *its operation*, but to enable and invite the people to make schools by *their agency*. It is believed, that there is but one requisite for a good common school:—the attentiveness of the people to it, and their fostering care. It is doubted, whether all other things by the way of system and arrangement, without this, can make a good common school. Our system is simple and easily understood: having divided the counties into school districts, it constitutes each school district a community, with power to provide a school according to its will: the school voters in regular meetings, by a majority of votes, appoint their school committee, clothed with full powers for providing a school, and determine what sum shall be raised, and the manner of raising it. Each school district, therefore, has the responsibility and charge of its own school committed to it, and it is encouraged to the fulfillment of this responsibility by a liberal dividend from the school fund, to be paid to its school committee, upon twenty-five dollars being raised in the district. The original provision was, that a school district, to receive the dividend from the school fund, must raise a sum equal to it. It is submitted, that it was error to alter this provision. Certainly a district ought to raise as much as it receives. The principle of the system, that the people shall be interested in their own school, so as to take care of it, requires that they should pay at least as much as is paid for them. It is respectfully suggested to the General Assembly, that a gradual return to the original provision, is required by propriety and expediency.

A very great embarrassment has been experienced in procuring collectors of school taxes. The school conventions in this county, for three successive years, have expressed the opinion, that great relief would arise from making the collection of these taxes the duty of the hundred collectors. A bill with provisions deemed suitable, has been presented to the General Assembly for their consideration.

It has been represented, that in a school district of this county, the chairman and secretary of the meeting in 1838, refused to make and sign a certificate of the meeting. In consequence, the district was disorganised, and its dividend lost. The school law does not contemplate the case; a bill has been prepared for the consideration of the General Assembly, to provide against this mischief in future. It may be remarked, that however strongly the chairman and secretary may be opposed to the proceedings of the meeting, our republican principles, on which all

our institutions rest, require, that the will of the majority shall be observed, and in the end far more evil must arise from thwarting it, than from conforming to it, in any case.

These defects being supplied, our school system, is believed to be complete upon the principle on which it has been constructed. Complaints in respect to schools arise not from the law, but from the execution: and they should be made, not to the General Assembly, but to the school districts. The General Assembly has exercised toward common schools enlightened liberality: in no State, except Connecticut, is there so generous public provision; the school districts are organised to manage their own schools according to their own judgments; if they will neglect this matter of vital concern, involving the usefulness and happiness of their own children, who can attend to it for them? Must they not be left to gain wisdom by the bitterness resulting from the rejection of inestimable benefits? The General Assembly might as well be called upon to provide for educating children without their going through the wearisome process of study and recitation, as to provide a system of schools to work well without the care, and pains and diligence of the people interested in them. The great need is to awaken the people upon this subject, lead to form a just estimate of it, and enlist their feelings and their judgments in behalf of their children, to afford them opportunity for education, so that instead of losing the best period of life for improvement and being in consequence subjected to disadvantages and mischiefs that must forever depress them, they shall be placed on fair ground to pursue respectability and influence. School conventions gathering people from the school districts of a county to discuss this subject, and devise the best means of profiting by it, are calculated to be very useful; and members of the General Assembly and other prominent individuals by countenancing and aiding these measures, and contributing their influence to help forward the cause, can effect far more of good, than any possible course of legislation. The simple want is, that people should feel such an interest in the well being of their children, and form such an estimate of the improvement of their minds, as to make them in earnest to supply proper schools for them.

At one period of our national history, there was deep discouragement on many gifted minds with respect to our free institutions. It was supposed they must fail. Apprehension of this nature was supposed to have hastened the death of a distinguished statesman. But our institutions have stood; and without one step of progress being perceived, they have made great advances. From what have the advances resulted? The silent but ceaseless energies of free minds, directed to the attainment of their own best interests. In our school conventions the opinion has been frequently expressed by intelligent, practical men, that although there is much that is disheartening in respect to common schools, there is nevertheless, progress giving reasonable assurance of ultimate success. It is to be considered, that the system was commenced under inveterate prejudices; that numbers and influence were imbued with these prejudices; and that the strength of society, the portion that ought to animate the system, too often has directed against it every form of hostility. If its friends

are firm and faithful, their assiduity, with time and patience, will crown it with success.

There is one amendment that would be useful at first, and accelerate the progress of the system. The only question is, whether the public mind will admit it. Upon this point, there is some instruction from the fact, that the principle of this amendment was discussed in the school convention in this county of 1839, and carried in the resolution "that a change of the school law should be made in respect to assessing taxes; the assessments of school tax to be made by the Levy Court in each county." Men of prudence and practical intelligence voted for the proposition. There has been great prejudice against taxation as a feature of this system. This prejudice is indeed blind; for, to have schools there must be money to procure teachers and accommodations; and taxation is the only efficacious method of raising money. To deny taxation in a school system, is to resolve upon the end without the means. But prejudice is none the less difficult, because blind. From the original act commencing our school system, the feature of taxation was entirely stricken. It was afterward introduced very timorously. The system has halted on this point; and it is not what it was designed to be; having been constrained to feel its way with great caution. The suggested amendment is, that the Levy Court shall assess a school tax upon the taxables of every school district, to be placed to the credit of the district, and paid over to its school committee. The amount of the tax might be regulated to raise in each district a clear sum equal to the dividend of the district from the school fund the preceding year, allowing to the districts the right to prescribe a larger sum. The hundred assessors could be required to estimate the clear rental value of the real estate in the school districts, or the school commissioners to return their valuations in this respect, to the Levy Court, so that the assessment could be made upon the principle prescribed by the school laws. This amendment would relieve school districts from their greatest embarrassment—determining upon the sum to be raised, and the manner of raising it. Their principal duty would be choosing their school committee. As the money would be raised at any rate, they would have a school as a certainty. There can be no objection, when the Legislature gives to a district one hundred dollars, to tax them with another hundred dollars, when both sums are to be laid out according to their direction, in their own neighborhood, for schooling their own children. It is giving them two dollars for raising one for the most interesting of all purposes, and expended, as no other tax is, under their immediate supervision. While the conducting of their own schools should be left under the power of the people, the law should so organise them as to make their mode of action simple, and suffer no obstructions to lie in their way. The sum to be raised, and the question of taxation, do occasion serious, perverse, and sometimes fatal embarrassments in the districts. In some districts, a generation has already been sacrificed in this way: for, six or eight years remove from the generation needing school privileges beyond their enjoyment. The subject is worthy of consideration.

In this connection another amendment was intimated in our last con-

vention. It was stated, that a man sells his farm: the purchaser runs in debt for it, giving his bond. Thus the value remains with the seller, holding the bond; the purchaser is no wealthier than before his purchase; he may be young and enterprising, worthy of encouragement; but the school law takes the tax off from the seller, and imposes it on the purchaser. It is obvious, that the principle of this amendment does not belong to the school law. The school law adopts the assessment made under the general law, except in the case of real estate. If the seller ought to be assessed for the money due upon the bond given for his farm, this principle ought to be incorporated in the general law, and not restricted to the pittance of a school tax. There is now provision upon this point. *Digest*, 390, (127.) A person may be "assessed for a capital not exceeding one thousand pounds," "in addition to his assessment." If it be inquired, why the sum was fixed so low, it may be replied, that no subject is more difficult than taxing a man for money due to him: he may have debts due to him to the amount of \$10,000, and he may owe the same or a larger amount. His debts may be doubtful; although deemed perfectly safe, they may fail. Besides, to carry out such a principle of taxation, there must be an inquiry into all the debts of the community; every man's affairs, of debt and credit, personal concerns of great delicacy, must be exposed to a public officer.

One of the greatest hindrances to our common schools, arises from want of suitable teachers; and it is a most perplexing question, how to produce a supply. This difficulty is not confined to our system; it prevails throughout the Union. In Massachusetts, where common schools entered as elements into the first formation of society, after more than a century of their operation, the burden of the subject is, how to obtain suitable teachers. In that state, the leading minds have concurred in recommending the establishment of NORMAL schools. These are schools for qualifying persons to be teachers of common schools; they are formed upon the principle, that in order to teach advantageously, it is not enough to be master of the matter to be taught, but that the art and manner of teaching are equally important; and it is their design to instruct in this art and manner, as well as to confer higher attainment in the proper branches. This kind of school (the NORMAL) has been adopted from Prussia, where the KING in whom "the whole legislative and executive power is vested without responsibility or control," "the people having no voice or influence in any of the affairs of the nation," has in the arrangement of his government a DEPARTMENT OF INSTRUCTION, under which the means of instruction are organised in regular gradation, and among these are NORMAL SCHOOLS for preparing teachers of common schools.

Absolute power can readily arrange a system of education, perfect in the exhibition: a regular gradation from top to bottom, each part holding up that below, and upholding that above it. Such is the Prussian system; and learned men, curious in these matters, seem disposed to make it their pattern. We hear nothing of the common schools in New England, but their obstacles and defects. The parish schools of Scotland are in worse condition still. But we should look carefully into the fruits of things, to learn their character. Many philosophical fantasies are beautiful, and

also empty and vain. The world has always abounded in gimcracks; and there are more in relation to no subject than the manner of education. To estimate common schools, we should consider the people formed by them. In Prussia the people are without rights, the subjects of a military despotism; in some provinces there are occasional assemblies with very restricted powers, but it is said, they scarcely dare make even a representation to the monarch! In Scotland, the common people are distinguished throughout the world for intelligence and strength of character: the same is true of the common people of New England. In Prussia, their system of common schools is deemed above praise; while the intelligence and standing of the common people are by no means desirable. In Scotland and New England, while the common schools are deemed wretched, the intelligence and standing of the common people are of high elevation.

The projects on this subject of providing a supply of teachers, seem to be the conceptions of scholars in studies, rather than expedients of practical men, having regard to the principles of business and the condition of society. If persons are educated specially to be teachers of common schools, this must become a profession, Teaching of common schools must be their way of livelihood. Is this consistent with the circumstances of the great mass of common schools? A young gentleman from Massachusetts, in the senior class of college, came to Wilmington in November, desirous of employment as a school teacher. One of the best school districts of the county was in treaty with him, and concluded that they could not give more than eighty dollars a quarter—\$320 a year. They said, that a fair consideration of the ability of their district would not allow them to make a higher offer. When his board and clothes should be deducted, there would remain to him for incidental expenses and wages, for a year, about \$100. He went to Pennsylvania, to inquire concerning a school that had been recommended in the country, not far from Philadelphia. He said wages in that State were lower than in this. He went to Virginia. If teaching of common schools is to be a profession followed by persons specially educated, if persons are to rely upon it as a means of livelihood, wages must not only be raised, but permanency given to the employment. Such a teacher could not teach a school for six months or less; he must have continual employment, or starve. In Massachusetts, in my childhood, there were few common schools taught more than three months in the year by a male teacher; his employment was confined to the winter months. In the most pleasant part of the other seasons, they had female teachers. Such schools cannot have teachers specially educated, and following school teaching as a profession. What could such a teacher do at the end of his three months? considering that the far greater number of the schools would be in the same way, employing a male teacher for a limited period. How many of the school districts in this State, in the best circumstances they can expect, must adopt the arrangement of male teaching a part of the year, and female teaching the residue? How few of our districts will raise money, so as to exceed with the school fund dividend, three hundred and twenty dollars a year? It is obvious, therefore, that the far greater portion of the school districts

of this State, probably nine-tenths of them, will not be adapted to have teachers specially educated, making the teaching of common schools a profession; but that they must be supplied with teachers of a different kind. The circumstance of the teaching of common schools being a profession, of there being a class of persons specially educated, would make a standard, and degrade and discountenance all persons not coming up to it; no persons of honorable feelings, not specially qualified by the prescribed education, would think of teaching; and although some few districts might have the benefit of select teachers, the greater number must be content with inferior ones, more degraded in consequence of the standard of special education; and their condition in this respect would be made worse than it now is. We want a supply of teachers for *common schools*, such as our districts can employ in their *common schools*; and sufficient for *all* our common schools. Teachers educated specially in *NORMAL* schools may have special qualifications of superior value; although as a general position this is doubted; it is believed to be a notion: but such teachers cannot be teachers of common schools: common schools cannot employ them: for common schools we must have a supply of such teachers as common schools can employ.

Colleges and academics have been represented as the proper sources to supply teachers of common schools. In our circumstances the supply could not be adequate. But it is not believed, that young gentlemen in academics and colleges, in general, are the best teachers of common schools. What would be the voice of those having experience or observation in relation to this matter, so far as their observation or experience extends? In Massachusetts, one argument in favor of *NORMAL SCHOOLS* to supply teachers is, that colleges and academics will not answer. It has been suggested, that colleges, academics and common schools are one system, cognate parts of a complete conformation; the head sending vitality through the members, giving grace, strength and motion. This view is deemed mistaken. There must be colleges and academics: and there will be as many as are needed. It is important there should be such institutions; they are indispensable to produce learned men, required as ornaments of the nation and to fill its places of high and arduous trust, as well as to embellish and benefit the common circles of society. Many persons are not content, that their children should receive a common education: other youth of themselves aspire to higher things: this is all well. But these are not the persons who favor common schools. The course of education is upward, not downward. Those advanced have little sympathy with those behind. Common schools are upon their own foundation, apart by themselves. If the portion of the community dependent upon them for the education of their children do not foster them, no one else will. Has not one great cause of apathy and even hostility to common schools arisen from so many persons educating their children in select schools? Academics so far from being favorable to common schools, tend to their injury; because the people most interested in education and most able to promote it, look to the academy, and there send their children, leaving the common school to languish, weakened and disparaged through their help and countenance being withdrawn. In a valuable pe-

riodical published at Boston, "the common school Journal," a writer of much ability and practical observation illustrates this matter in respect to Massachusetts, making it plain, that the depressed condition of the common schools was partly attributable to the numerous academies; and it further appears in that paper, that in those towns where the people had relinquished the academy for the common schools, the latter were resuscitated, and conducted with unprecedented prosperity. It is also believed, that common schools are injured by literary persons fixing too high a standard for them under existing circumstances, and thus disparaging their actual condition, producing discontent, a disposition to look upon them as worth nothing, and a contemptuous disregard of them. Literary character is not the only attribute of usefulness, incident to common schools: the literary character of the common schools of Scotland is low; but not so the standing and intelligence of the people formed in them: the literary character was very low of the common schools of New England, in which were formed a great portion of the men, who could receive, appreciate and establish, without flattering, the institutions of freedom: a matter in which England failed. France has twice failed, and in the states of Spanish America, failure has followed failure in quick succession for a quarter of a century.

In this country we do not properly appreciate the people. In matter of profession, we say more than enough; but in matter of practice we do not esteem them adequate to the responsibilities under which they are placed by the structure of our institutions. In other countries, the doctrine has been and still is, that the people are not capable of managing their own concerns, and that there must be classes of men specially prepared to take the superintendency. Upon this principle we see government so extensively constructed in the old world, expecting in the people no capability of important functions, and allowing them no valuable rights. We have repudiated this notion from our political economy; and yet how powerfully does it influence our conduct? How much organization is there to do good to the people; and when what is beneficial for them is contemplated, how customary is it, to look to a higher sphere to obtain the agency and the means? Every thing must be done *for* them; it their part to pay for doing it. What but this notion prevents us from looking to common schools for a supply of teachers for common schools?—they are the natural source; and whenever public opinion shall expect from them this supply, the expectation will be answered. While we expect nothing from common schools in this respect, while in conformity of the notion just noticed, we suppose them incapable of helping themselves, and that whatever they have must come from a higher orbit, they will remain as incompetent as we suppose them: for the surest way of prevention is to form and countenance the supposition of impracticability. Expect nothing and you will receive nothing.

Colleges supply their own teachers. Scholars leaving college, are called directly back to the tutors or professors. Why cannot scholars of common schools, having gone through a course of education in them, likewise become teachers of what they have learned. The argument for common schools is stronger than for colleges, because the numbers from

common schools are so much greater, and of course greater variety of mind and qualification to select from. In every district there might not be found a suitable teacher; but far more frequently there would be found several, of superior mental power and more diligent application than common, capable of instructing young men, in the ardor of youth, who set about teaching what they have just learned, are the best teachers. Besides, such teachers would have sympathy with the schools taught by them; while teachers formed in the other way suggested, would look down upon common schools as below their grade of education, and would undervalue them: a frame of mind not promising cordiality in work.

The custom of procuring teachers of common schools among those educated in them, would elevate the schools in common estimation, would be an inducement to excel, and would open to our youth a field of employment in which they could serve the community usefully, and gather profit themselves. In Massachusetts, in my childhood, a young man of that town, without other education than that of common schools, was much employed, and very acceptable, as a teacher. It may be objected, that the schools under this custom must be stationary, without improvement. There is mistake in such an objection; for no one learns faster than an attentive and faithful teacher. He is led to search more thoroughly, investigate more deeply, and follow out branches just opened in school. I was informed a few days ago, with respect to a teacher of uncommon excellence, employed in this county some years ago, who conducted his school to unusual attainment, that he was necessitated to study hard at night, to keep ahead of his scholars the next day. Every living thing, through inherent, vital principles, grows till it reaches its proper stature. It is morally so. Our district schools, if taken care of, will grow by their inherent energy. They need no foreign application of excitement. Our hinderance is, in looking for a supply of teachers to sources which fail, and must fail. Because our district schools in their infancy, under the care of the prejudiced and the influential, have not produced teachers, we have no thought that they can produce them; nor can they while we continue in this habit of thinking. But let public opinion hold out encouragement to those dependent on district schools for instruction, that they may expect to be teachers, if qualified, and there will soon be a change. We may regard it as a certainty, that we must obtain our teachers among our own people; and that for a considerable portion of our schools we must have teachers, not depending on school teaching as their only employment, but using it as occasional and auxiliary to other occupations or pursuits.

Under any system of common schools, progress must be slow. When the public mind is to be moulded anew upon any subject, much time is required for the work. Popular education, common schools, afford a fine theme for declamation, but in practical operation they are discouraging, tedious and perplexing; especially among free communities, where every man regards the maintenance of his opinion as a right. One of the most zealous supporters of free schools in this county, because the majority of his district were opposed to his views and insisted on what he did not approve, became a violent enemy to the system and continued so, until his

death. I have been informed of a similar case in another county. Sometimes a few individuals are opposed to a large community, and do every thing to thwart them, because not suffered to govern them. The minds of our people and the manners of our time do not accord with such a condition of things; it does not suit us to move by slow and numerous and occasional retrograde steps, with scarcely perceptible advancement: we require the most accelerated speed. Instead of depending upon time to mature and effectuate in its slow but certain course, we are dissatisfied unless we can bound from beginning to end by a single leap. There may be danger from this disposition; as it may lead to constant change, leaving nothing to become perfect. Things of the best and most lasting properties are of slow growth. If a society of learned men, in enlarged benevolence, were to place a school of their own choice, at their own cost, in a district, it would probably answer no useful purpose. It might not be suited to the people, they would feel no interest in it; and neglect would be consequence of indifference. In Prussia, the law compels parents and masters to send children to school. We can have no such law: our people are freemen, and will not bear too much government. Our dependence must be upon the interest taken in schools, upon public opinion constraining parents to send, and children to go to school, through the impression that this is as necessary to respectability and well being, as food and clothing are to comfort, and no more to be dispensed with. It is believed, that this interest, this public opinion, can arise only from people taking a part in the school business of their district.

I refer to copies of the proceedings of the New Castle county School Convention for 1838, 1839 and 1840, accompanying this report. Annexed to the copy of the convention of 1838, are several reports made upon inquiry into the manner of procuring teachers for common schools.

All of which is respectfully submitted.

WILLARD HALL,

*Sup't of Free Schools, New Castle county.*

On motion of Mr. Huffington,  
The House then adjourned until this afternoon at 3 o'clock.



*Eodem Die, 3 o'clock P. M.*

The House met pursuant to adjournment.

On motion of Mr. Barr,  
The resolution submitted by him some days since, for the appointment of an Auditor of Accounts, was taken up for consideration and read.

Mr. Huffington then moved,

That the House proceed to ballot for a person with whose name to fill the blank in said resolution.

Which motion

*Prevailed.*

And the first ballot stood:—

For Liston A. Houston,	14 votes.
James B. Ralston,	1 vote.
Joseph L. Harper,	1
John M'Dowell,	1
Benjamin Benson,	1

Whereupon.

The Speaker then declared that LISTON A. HOUSTON, having received a majority of the whole number of votes, was duly elected Auditor of Accounts.

On motion of Mr. Huffington,

The blank in the said resolution was filled with the name of Liston A. Houston.

On motion of Mr. Dale,  
The said resolution was then

*Adopted.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Black,

The resolution heretofore submitted by him for the appointment of a State Treasurer was taken up for consideration.

On motion of Mr. Higgins,

The House then proceeded to elect by ballot a person with whose name to fill the blank in the said resolution.

The result of the balloting was as follows, viz:—

For William D Waples,	15 votes.
William Russel,	3
Aaron Marshall,	1

The Speaker then declared that WILLIAM D. WAPLES having received a majority of all the votes, was duly elected State Treasurer.

Mr. Higgins then moved,

That the blank in the said resolution be filled with the name of William D. Waples.

Which motion

*Prevailed.*

On motion of Mr. Johnson,  
The resolution was then

*Adopted.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Dale,

The bill entitled "An act granting to William Cleaver, jr. of New Castle county, a certain tract or parcel of waste and uncultivated land therein described," was read a third time by paragraphs and

*Passed the House.*

*Ordered* to the Senate for concurrence.

Mr. Betts, chairman of the committee to whom was referred the petition of the members of the Washington Beneficial Society of Wilmington, Delaware, praying an act to incorporate said society, reported a bill entitled "An act to incorporate the Washington Beneficial Society of Wilmington, Delaware, for the relief of the members thereof, their widows and orphan children."

On motion of Mr. Betts,

The said bill was read.

Mr. Wright presented the petition of Joseph Wells of Sussex county, praying the Legislature to pass a law to enable him to locate a certain tract of vacant land therein described.

On his motion,

The said petition was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Wright, Chamberlain and Collins.

Mr. Fisher, Clerk of the Senate being admitted, presented for the concurrence of the House, a joint resolution providing for the printing of the report of the State Geologist.

And he withdrew.

On motion of Mr. Huffington,

The said resolution was read, as follows, viz:—

“IN SENATE, *January 20, 1841.*

*Resolved by the Senate and House of Representatives of the State of Delaware, in General Assembly met,* That the Clerk of the Senate be, and he is hereby authorised to cause to be printed and distributed, one thousand copies of the report transmitted by the State Geologist, and all maps which he may deem expedient to have appended to said report, and that the expenses of said printing shall be defrayed out of the balance remaining in the hands of the commissioners appointed under an act entitled "An act to provide for a Geological and Mineralogical Survey of this State," and from such other funds as are not otherwise appropriated.

*Extract from the Journal.*

G. P. FISHER, *Clerk.*

*For concurrence."*

On motion of Mr. Huffington,

The said resolution was laid on the table for consideration.

Mr. Collins laid on the table the following resolution, which

On his motion,  
Was read, to wit:—

*Resolved*, That so much of the Governor's Inaugural Address as relates to the penal laws of this State, be referred to a committee of three, with leave to report by bill or otherwise.

On his motion,  
The resolution was then

*Adopted.*

And the Speaker appointed Messrs. Collins, Barr and Marshall that committee.

Mr. Betts, chairman of the committee to whom was referred the petition of the members of the Fame Hose Company of Wilmington, praying the Legislature for an act of incorporation, reported a bill entitled "An act to incorporate the members of the Fame Hose Company of the city of Wilmington," which

On his motion,  
Was read.

On motion of Mr. Wright,  
The joint resolution submitted by him last week for a temporary adjournment was taken up for consideration.

Mr. Huffington then submitted the following amendments, to wit:—

Amend the said resolution by striking out the word "Wednesday" in the 4th line thereof, and inserting in lieu thereof the word "Thursday."

Also, by striking out the word "Tuesday" in the last line thereof, and inserting in lieu thereof the word "Wednesday."

On motion of Mr. Huffington,  
The said amendments were then

*Adopted.*

And

On motion of Mr. Wright,  
The resolution as amended

*Was adopted.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Black,  
The bill entitled "An additional supplement to the act entitled 'An act to amend the act entitled 'An act concerning the constitution of the Levy Court and Court of Appeal,'" was read a third time by paragraphs and

*Passed the House.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Marshall,  
The bill entitled "An act to repeal so much of the act entitled 'An act supplementary to 'An act for the protection of certain shell fisheries in this State,'" was taken up for consideration.

He then moved,  
That the said bill be re-committed to the committee that reported it.  
Which motion

*Prevailed.*

Mr. Wilds presented the petition of certain citizens of Kent county, praying the Legislature to pass an act to enable them the more effectually to ditch and drain their low grounds:

And he also, at the same time presented the remonstrance of certain other citizens against the prayer of the said petition.

All of which were

On his motion,  
Read and referred to a committee of three members with leave to report by bill or otherwise.

That committee consists of Messrs. Wilds, Frazer and Huffington.

On motion of Mr. Dale,  
The House then adjourned until to-morrow morning at 10 o'clock.



THURSDAY, 10 o'clock A. M., January 21, 1841.

The House convened pursuant to adjournment.

Mr. Black moved that the eighth rule of the House be suspended, in order that he might introduce a bill.

Which motion

*Prevailed.*

He then asked, and,

On motion of Mr. Higgins,  
Obtained leave to introduce a bill entitled "An act to amend the act entitled 'An act concerning the Levy Court, Clerk of the Peace, Assessor, Collectors and County Treasurers,'" which,

On his motion,  
Was read.

Mr. Clements presented the claim of Joseph Buckmaster against the State, which,

On his motion,  
Was read and referred to the committee of claims.

He presented also the claim of David M. Smith, an agent appointed by the Governor to bring into this State a fugitive from justice, which,

On his motion,  
Was also read and referred to the committee of claims.

On motion of Mr. Johnson,

The bill entitled "An act to enable John Watkins to locate certain vacant land in North West Fork hundred in Sussex county, and to complete his title to the same," was read a second time.

On motion of Mr. Higgins,

The bill entitled "A supplement to the act entitled 'An act to enable Amanda Green, Jane Green and Charles Green, minors, to sell and convey certain real estate therein mentioned,'" was read a third time by paragraphs, and

*Passed the House.*

*Ordered* to be returned to the Senate.

Mr. Fisher, Clerk of the Senate, being admitted, informed the House that the Senate had concurred in the joint resolution for the appointment of an Auditor of Accounts, with an amendment, in which the concurrence of the House was desired.

And he withdrew.

On motion of Mr. Huffington,

That amendment was read as follows, viz:—

"IN SENATE, *January 21, 1841.*

Strike out the name of Liston A. Houston, and insert the name of Simon Spearman.

*Extract from the Journal,*

G. P. FISHER, *Clerk.*

*For concurrence."*

Mr. Huffington then moved,  
That the House non-concur in the said amendment of the Senate.

Which motion

*Prevailed.*

*Ordered* that the Senate be informed thereof.

Which was done.

On motion of Mr. Huffington,

The said resolution was then

*Indefinitely postponed.*

Mr. Huffington laid on the table the following resolution, which,

On his motion,  
Was read to wit:—

*Resolved by the House of Representatives, by and with the concurrence of the Senate,* That \_\_\_\_\_ be and hereby is appointed Auditor of Accounts.

Mr. Huffington then moved,

That the House proceed to elect by ballot a person with whose name to fill the blank in the said resolution.

The House being divided,  
The Speaker ordered the yeas and nays, which were taken,  
And they are as follow, viz:—

*Yeas*.—Messrs. Black, Chamberlain, Clements, Dale, Frazer, Higgins, Huffingtōn, Johnson, Marshall, Wilds and Wright—11.

*Nays*.—Messrs. Collins, Hill, Jefferson, Virden and Mr. Speaker—5.

So the said motion

*Prevailed.*

And the House proceeded to ballot for an Auditor of Accounts.

And the result was as follows:—

For Simon Spearman,	8 votes.
Liston A. Houston,	5
Benjamin Benson,	2
John M'Dowell,	1

There being *no choice*,

On motion of Mr. Huffingtōn,  
The House proceeded to ballot again for a person with whose name to fill the blank in the said resolution.

And the result of the balloting was as follows, viz:—

For John M'Dowell,	1 vote.
Simon Spearman,	9 votes.
Liston A. Houston,	4
Benjamin Benson,	2

The Speaker then declared that SIMON SPEARMAN having received a majority of all the votes, was duly elected to fill the blank in the said resolution.

On motion of Mr. Johnson,  
The blank in the said resolution was then filled with the name of *Simon Spearman*.

Mr. Johnson then moved,  
That the said resolution be adopted.  
The House being divided upon the question, the Speaker ordered the yeas and nays, which were taken, and are as follow:

*Yeas*.—Messrs. Black, Chamberlain, Clements, Dale, Frazer, Higgins, Hill, Huffingtōn, Jefferson, Johnson, Marshall, Wilds, Wright and Mr. Speaker—14.

*Nays*.—Messrs. Collins and Virden—2.

So the motion

*Prevailed.*

And the resolution, with the name of Simon Spearman inserted in the blank therein,

*Was adopted.*

*Ordered* to the Senate for concurrence.

Mr. Dale chairman of the committee appointed on the part of the House to settle with the State Treasurer, made the following report, which,

On motion of Mr. Clements,  
Was read, viz:—

The committee appointed by the House of Representatives, to act jointly with the committee of the Senate to examine the accounts of the State Treasurer and Trustee of the School Fund, count the cash on hand and effect a settlement with that officer, beg leave to make the following report:—

On the 16th day of December, 1840, the State Treasurer settled with the Auditor of Accounts, at which time there was due from him to the State of Delaware, the sum of - - - \$8,376 58

Since when he has received from Wm. Wallace, by the hand	
of D. H. Stayton, late sheriff of Kent county,	29 67
From D. H. Stayton, late sheriff of Kent county,	77 50
From Elihu Jefferson, late sheriff of New Castle county,	98 00
	<hr/>
	\$8,581 75

And that since then he has paid to Wm. A Sutton	\$14 85
Wm. M. Gemmill, for cocoons,	17 02
Eliza J. Kennedy,	6 00
J. L. Harper, 1 quarter's salary,	125 00
Elijah Cannon, State Treasurer, 1 year's salary,	500 00
Do. for commission on \$29 67, received of Wm. Wallace,	1 48
	<hr/>
	664 35

Balance due the State,	<hr/>
	\$7917 40

On the 16th day of December last the Trustee of the School Fund settled with the Auditor of Accounts, at which time there was due from him to the said fund and school districts, \$18,433 91

Since which time he has paid school district No. 54, Sussex county,	63 14
School district No. 7, N. C. county,	121 47
“ 44, “	121 47
“ 67, “	121 47
“ 38, Kent county,	180 32
	<hr/>
	607 87

Balance due school fund and districts,	<hr/>
	\$17,826 04

## AGGREGATE.

Due from State Treasurer	7,917 40
“ Trustee of school fund	17,823 04
	<hr/>
	\$25,743 44
	<hr/>

The committee find the sum of \$25,743 44 is deposited to the credit of the State Treasurer in the Farmers' Bank at Dover and Georgetown.

The committee further report, that there has been received by the State Treasurer for dividends and interest upon the investments and loans of the surplus money directed by the act of 22nd Feb. 1837, to be apportioned among the several counties in equal proportions, to wit:

This sum received of the Wilmington and Susquehanna Rail Road Company, 6 mos. interest on \$51,587 66, due in Oct. 1838,	\$1,547 63
Received of the Farmers' Bank, for dividend on 5000 shares of increased capital stock due January, 1839,	5,400 00
Received of the Wilmington and Susquehanna Rail Road Company, for 6 mos. interest on \$29,206 17, due Jan. 10, 1839,	876 17
Received of Wilmington and Susquehanna Rail Road Company, for 6 mos. interest on \$56,587 67, due April 1, 1839,	1,331 38
Received of ditto for interest on \$29,206 17, due April 1, 1839,	384 07
Received of Farmers' Bank for dividend on 5000 shares of stock, due July, 1839,	5,400 00
Received of Philadelphia and Baltimore Rail Road Company, for 6 mos. interest on \$80,793 83, due in October, 1839,	2,423 81
	<hr/>
	\$17,363 06
	<hr/>

That the said sum of \$17,363 06 has not been distributed as is directed by said act, but has been applied to the expenditures of the State so far as the same was required, except the sum of \$3,186 50, which has been paid to the treasurer of Sussex county, and to the treasurer of the poor of said county. It appears, therefore, that there is due to New Castle county \$5,787 68, distributable among the school districts of that county; to Kent county a like sum of \$5,787 68, and to Sussex county \$1,929 23, distributable among the school districts of that county, and to the Treasurer of the Poor of that county the sum of \$671 95.

By the report of the Auditor of Accounts it appears that the State Treasurer has paid to the Treasurer of the Poor of Sussex county \$3,343 90 in the last year, out of the funds belonging to the State, instead of out of the dividends and interest of last year, arising from the investments and loan of the money received by this State of the United States.

The committee are unable to discover from the Report of the Auditor of Accounts that the interest on \$5000 which is directed by the act passed Feb. 17, 1837, to be loaned to Sussex county, has for the last two years been charged to that county, or any part of it credited New Castle and Kent counties, as is directed by said act. The charge of interest upon said sum of \$5000, and credit to the other counties will vary the amounts before stated as due to each county, to the amount of debit and credit each is entitled to.

The committee cannot discover from the Report of the Auditor of Accounts for 1839 and 1840, that any thing has been received from the State Treasurer and Trustee of the School Fund on account of the lottery authorised by the "Act authorising a lottery for the benefit of Delaware College and other purposes therein mentioned," passed Feb. 11, 1835, since April, 1839, and that therefore there is due and unpaid to the State and school fund seven instalments, amounting to \$9,076 03.

The Auditor of Accounts in his last settlement with the State Treasurer, has allowed him \$301 30 commissions, and your committee are unable to discover whether the allowance is correct or not, as neither the State Treasurer nor Auditor has furnished the items upon which the allowance has been made.

*January 20, 1841.*

Mr. Fisher, Clerk of the Senate being admitted, informed the House that the Senate had concurred in the joint resolution for the appointment of a State Treasurer.

And also in the joint resolution for the appointment of an Auditor of Accounts.

And he withdrew.

Mr. Wright presented the memorial of sundry citizens of Sussex county, praying for an amendment of the act entitled "An act authorising a lottery for the building an Academy and Masonic Hall in Georgetown, Sussex county, and for finishing the Episcopal Church therein."

On motion of Mr. Wright,

The said memorial was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Wright, Sudler and Marshall.

On motion of Mr. Black,

The House then adjourned until three o'clock this afternoon.



*Eodem Die, 3 o'clock, P. M.*

The House met pursuant to adjournment.

Mr. Huffington presented the memorial of the citizens of the town of Dover, praying the Legislature for the passage of a bill accompanying the said memorial, making certain alterations in their town charter.

In order to expedite the wishes of the said memorialists,

Mr. Huffington moved,

That the eighth rule of the House be suspended, in order that he might introduce the bill accompanying the said memorial.

Which motion

*Prevailed.*

He then asked, and

On motion of Mr. Clements,

Obtained leave to introduce the said bill, which is entitled "An additional supplement to the act for establishing the boundaries of the town of Dover, and for other purposes therein mentioned."

On motion of Mr. Huffington,

The said bill was read.

Mr. Fisher, Clerk of the Senate being admitted, informed the House that the Senate had concurred in the joint resolution for a temporary adjournment.

And he withdrew.

Mr. Marshall, chairman of the committee to whom was re-committed the bill entitled "An act to repeal so much of the act entitled 'An act supplementary to an act for the preservation of certain shell fisheries in the State,'" reported the same back to the House with the following amendments, which

On his motion.

Were read and adopted, viz:—

Amend the said bill by striking out after the enacting clause and the word "That" in the first section of the bill, all the said bill, and substituting therefor the following, viz:—

From and after the passing of this act, the provision contained in the first section of the act entitled "An act supplementary to the act entitled 'An act for the preservation of certain shell fisheries within this State,' passed at Dover, February 4, 1835, which prohibits the taking or gathering of oysters "within the waters of any of the creeks or ponds in this State at any time between the fifteenth day of May and the fifteenth day of August," shall not extend to Broadkirk Creek, in the county of Sussex.

SEC. 2. *And be it enacted,* That hereafter it shall not be lawful for any person or persons to collect or gather oysters within the creek called Broadkirk creek, in Sussex county, with rakes or dredges.

SEC. 3. *And be it enacted,* That if any person or persons shall hereafter offend against any of the provisions contained in the second section of this act, every such person or persons so offending, shall for every

such offence, forfeit and pay a sum of money, not less than five dollars, and not more than twenty dollars, to be recovered with costs of suit by any person or persons who may sue for the same, before any Justice of the Peace in and for the county of Sussex, one half of which fine shall be paid to the person suing for the same, and the other half to the Treasurer of Sussex county for the use of the poor of said county.

Amend the title by striking out the words "so much of the act entitled," and inserting in lieu thereof the words "An act to amend the act entitled."

On motion of Mr. Marshall,  
The said bill as amended was read a third time by paragraphs, and  
*Passed the House.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Dale,  
The bill entitled "A supplement to an act entitled 'An act laying a tax on dogs in New Castle county, passed at Dover, February 21st, one thousand eight hundred and thirty-nine,'" was committed to a committee of five members.

That committee consists of Messrs. Dale, Chamberlain, Clements, Virden and Jefferson.

John W. Houston, Esq., the Secretary of State, being admitted, announced to the House, that Simon Spearman, Esq., the Auditor of Accounts, appointed this morning, had given bond as required by law.

And he withdrew.

Mr. Clements, chairman of the committee to whom was referred that portion of the message of the late Governor which relates to the appointment and compensation of certain Judges ad litem, made the following report, viz:—

The committee to whom was referred so much of the Governor's Message as relates to Judges ad litem, have had that subject under consideration, and have conferred with several gentlemen of the bench and the bar, and still find themselves at a loss to arrive at a satisfactory conclusion on the subject, but have agreed to submit for the consideration of the House a resolution on the subject.

*Resolved by the Senate and House of Representatives of the State of Delaware in General Assembly met,* That the State Treasurer be and he is hereby authorised and directed to pay to Martin W. Bates, Esq., the sum of \_\_\_\_\_ dollars for his services as Judge ad litem, under the appointment of the Governor of this State.

To Robert Frame, Esq., the sum of \_\_\_\_\_ dollars, for like services rendered.

To George B. Rodney, Esq., the sum of \_\_\_\_\_ dollars, for like services rendered.

On motion of Mr. Clements,  
The said report and resolution were laid on the table until after the adjournment.

On motion of Mr. Huffington,  
The House then adjourned until Wednesday next, at 10 o'clock, A. M.



WEDNESDAY, 10 o'clock A. M., January 27, 1841.

The House assembled pursuant to adjournment.

Mr. Marshall presented the petition of sundry persons in Sussex county, praying the Legislature to pass a law rendering certain officers ineligible for a second term, and for fixing a definite term to those offices which are now held at the will of the Executive.

On motion of Mr. Marshall,

The said petition was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Marshall, Higgins and Johnson.

Mr. Huffington, chairman of the committee to whom was referred that portion of the late Governor's Message which relates to the grievances of the people of the District of Columbia, as set forth in their memorial addressed to their fellow-citizens of the United States, made the following report, which,

On his motion,  
Was read, to wit:—

The committee to whom was referred so much of the Governor's Message as relates to the remonstrance of the citizens of the District of Columbia, appealing to the people of the United States, and to the Legislatures of the several States, against the course of legislation adopted by Congress towards them injurious to their rights and interests

*Report,* That having maturely examined the remonstrance of the citizens of the District of Columbia, to the people of the United States and to the Legislatures of the several States, against certain acts of a majority of Congress, your committee are constrained to view with great surprise and deep regret, the course of legislation pursued by Congress towards the people of the said district, who, in common with all the citizens of a free government, have a right to expect from their rulers, ample protection for their persons and property, and of such institutions established among them, as time and experience has proved convenient and necessary as the means whereby they may acquire support, independence and happiness.

The condition of the people residing within the District of Columbia is peculiar. They have no voice in the national councils, but are wholly dependent for their good or evil government, upon the Representatives of

the several States; they have no political power; hence, when they suffer from unwise, partial, or vindictive legislation, their only remedy lies in an appeal to the justice and magnanimity of the people, for a redress of grievances.

To enable Congress to carry into effect that part of the constitution which provides for the permanent establishment of a seat of government, the States of Virginia and Maryland, about the year 1789, ceded and relinquished to the Congress and government of the Union forever, in full and absolute right, and exclusive jurisdiction, as well of soil as of persons residing thereon, the territory since known as the District of Columbia, and in addition thereto, for the purpose of facilitating the erection of buildings for the accommodation of the President, Congress, and the several departments of government, and of fortifications for their defence and security, the State of Virginia voluntarily granted and paid to the United States, the sum of one hundred and twenty thousand dollars, and the State of Maryland the sum of seventy-two thousand dollars; and to render easy and practicable the intentions and wishes of the general government in laying out the plan of a federal city, now known as the city of Washington, the proprietors of the soil, in that part of the District of Columbia, generously conveyed in trust to the United States, all the land within the limits of the said city; the streets, avenues and squares, to be solely the property of the United States, and the lots to be equally divided between the grantors and the United States. Such very liberal cessions, gifts and grants, ought to have secured to the inhabitants of the ceded district, all the blessings attending a fair and impartial government; to have induced Congress (when about to legislate on matters involving their rights, interest and happiness) to afford them the greatest security and protection which could be granted consistently with the constitution and laws of the Union, to have been careful to enact no laws calculated to impair their natural or acquired rights, or refuse to pass such as would promote their general welfare and prosperity. In no case should the condition of the citizens of the District of Columbia have been made worse in consequence of the change of jurisdiction, from that of the States of Maryland and Virginia, to the United States.

The people of the District of Columbia, previously to its cession to the United States, were generally, and still continue, a commercial and manufacturing community, and as such required, and yet require the common facilities universally resorted to by that class of citizens to enable them to prosecute with success their respective avocations. As auxiliary to their interests, they had established, previously to the acceptance and organisation of the district, under the United States, several banking institutions to which others have since been added by several acts of Congress, as the business and growing population required. The National Legislature, (without hesitation,) until within a few years past, when either of the banks of the district, called for a renewal of its charter, made the necessary laws for its continuance, and the utmost confidence existed in the minds of all, that the system would be continued, so long as the banks conducted themselves in a manner to subserve the public convenience and interests. Expecting no change in this particular, the banks made libe-

ral advances to individuals, who extended their business in proportion to their increase of capital, thereby greatly accelerating the growth and prosperity of the cities of the district.

While the citizens of the district were thus pursuing by the ordinary means, their course towards independence if not wealth, the majority of Congress, regardless of consequences, and in the opinion of your committee, without any adequate or even probable cause, at their last session refused to recharter any of the Banks of the District of Columbia, only allowing to them for a very limited period a corporate existence, within which time they will be compelled to enforce payment of all debts due them and discharge all liabilities against them. A course of legislation calculated to impede the progress of improvement in the District and bring sudden and unlooked for ruin upon many who otherwise would have continued useful and independent members of the community. The citizens of the District in their remonstrance, charge that this harsh and unjustifiable act of oppression on the part of Congress, was occasioned by the vindictive spirit of party actuating a majority of the members of that body; and intended to punish them for their free expression of opinion in relation to the policy of the general administration. If the charge is true, and your committee are constrained unwillingly to admit that there appears good grounds for the belief in its truth, then indeed have we fallen upon evil times, requiring the utmost exertion of moral power to counteract and defeat the machinations of the fiend of party spirit, which if not properly rebuked, by a free expression of opinion, aided by the salutary influence of a proper exercise of the elective franchise, may one day tumble into ruins the fabric of our freedom. Let us therefore be wary: we cannot too constantly remember, that "the price of liberty is eternal vigilance."

The people of the District further complain of the injurious interference of Congress in their municipal regulations. In particular, the citizens of Washington alledge that a majority of Congress without cause or reason assigned, set aside an election held on the first of June last, for Mayor, Alderman and Council, for the stated term of two years; which act we cannot but consider one of high-handed oppression, worthy the condemnation of all who would be free.

Independent of that feeling which should prompt us at all times to sympathise with the oppressed, and if in our power, and in redressing their wrongs, the citizens of the District of Columbia, have additional claims to our serious consideration as descending from one common ancestry, and entitled as citizens of the same country, to the same rights and privileges secured to ourselves by the heroes of the revolution, and the sages who formed our happy Constitution. We, therefore, respectfully recommend the adoption of the following resolutions:—

*Resolved by the Senate and House of Representatives of the State of Delaware in General Assembly met,* That the cession by the States of Virginia and Maryland of the territory of the District of Columbia, their grants of money to facilitate the erection of suitable buildings and fortifications for the accommodation and security of the President, Congress,

and the several departments of the government, and the generous donation of lands by the proprietors of the soil upon which the city of Washington was laid out, and its plan perfected to the United States was highly beneficial, and merited a kind, liberal and generous consideration in return.

*Resolved*, That in the opinion of this Legislature, the refusal by a majority of Congress to recharter the banks of the District of Columbia was unwise and oppressive.

*Resolved*, That this Legislature are unwilling to believe with the citizens of Washington and Georgetown, that their only chance for good government and prosperity rests in a retrocession of the territory ceded to the United States, to the State of Maryland; but confidently hope the next, if not the present Congress will grant them ample redress of their grievances.

*Resolved*, That the people of the District of Columbia ought to be represented in the Congress of the United States, and that measures should be taken as soon as conveniently may be, to bring about such a just and desirable end.

*Resolved*, That the foregoing resolutions be signed by the Speaker of the Senate and the Speaker of the House of Representatives, and transmitted to our Senators and Representative in Congress, to be laid before their respective Houses.

On motion of Mr. Clements,  
The said report

*Was adopted.*

*Ordered* to the Senate for concurrence.

Mr. Betts presented the petition of the Washington Fire Company of Wilmington, praying the Legislature for an act of incorporation.

On his motion,

The said petition was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Betts, Clements and Jefferson.

Mr. Marshall moved,

That the eighth rule of the House be suspended, in order that he might introduce a bill.

Which motion

*Prevailed.*

He then asked, and

On motion of Mr. Clements,  
Obtained leave to introduce a bill entitled "An act to amend the act entitled "An act for the preservation of mill property," which

On his motion,  
Was read.

On motion of Mr. Marshall,  
The said bill was committed to a committee of three members, with a view to any amendments which may be deemed necessary.

That committee consists of Messrs. Marshall, Dale and Frazer.

Mr. Dale presented the petition of sundry citizens of New Castle county, praying the Legislature to extend the jurisdiction of Justices of the Peace to sums not exceeding one hundred dollars, allow them jurisdiction in cases of replevin not above that sum, and to increase their fees and also those of constables.

On his motion,

The said petition was read and referred to Messrs. Dale, Collins and Hill, with leave to report by bill or otherwise.

Mr. Betts presented a petition from sundry other citizens of New Castle county, praying the same objects.

On motion of Mr. Betts,

The said petition was read and referred to the committee appointed on the former petition.

Mr. Huffington presented the petition of sundry citizens of the town of Seaford and its vicinity, in the county of Sussex, praying the passage of a law to enable them to raise by lottery the sum of two thousand dollars, to be expended in the completion of the Episcopal church, situated in that town.

On motion of Mr. Huffington,

The said petition was read.

Mr. Huffington, chairman of the committee to whom was referred that portion of the message of the late Governor, delivered at the commencement of the session, which relates to the disfranchisement of the State of New Jersey by the House of Representatives of the United States, at the last session of Congress, made the following report, which,

On his motion,

Was read, to wit:—

The committee to whom was referred so much of the Governor's Message as relates to a communication from the Governor of the State of New Jersey, transmitting resolutions of the Legislature of the said State, protesting against the exclusion by the House of Representatives of the United States, of five persons duly commissioned and returned as Representatives of that State in the twenty-second Congress of the United States, report for adoption, the following resolutions:—

*Resolved by the Senate and House of Representatives of the State of Delaware, in General Assembly met,* That by the Constitution of the United States each State is entitled to a certain number of Senators and Representatives in the Congress of the United States, to be appointed and elected by the several States according to the constitution and laws thereof; and that the only evidence which can properly be received by Congress of the right of Senators or Representatives to a seat in either branch of the National Legislature, in the first instance, is their certificates or commissions, duly authenticated according to the constitution and laws of the respective States.

*Resolved*, That it appears manifest to this Legislature, that John B. Aycrigg, John P. B. Maxwell, William Halsted, Charles C. Stratton and Thomas Jones Yorke, were duly commissioned to represent the people of the State of New Jersey in the twenty-sixth Congress of the United States; that they appeared, produced their commissions and claimed their seats in the House of Representatives of the United States, and were prevented from exercising the right of forming and organising a House of Representatives, by a majority of members elect from other States who appeared, claimed, and obtained their seats, in virtue of exactly the same kind of evidence and authority, produced and insisted upon by the excluded members from the State of New Jersey; that said acts and doings of the majority of the members elect of the House of Representatives of the twenty-sixth Congress were unwarranted, unjust and unconstitutional, and ought to be protested against by the Legislature of every State, lest the said acts and doings should hereafter be claimed as a precedent, and made the excuse for disfranchising a sovereign State, whenever a majority of either House of Congress from caprice, or strong party feeling may choose so to do, regardless of right and in contempt of consequences which might produce open rebellion, and perhaps a dissolution of the Union.

*Resolved*, That a copy of these resolutions be transmitted to each of our Senators and Representative in Congress, with a request that they lay the same before their respective Houses, also to the Governor of the State of New Jersey, to be laid before the Legislature of said State.

On motion of Mr. Huffington,  
The said report

*Was adopted.*

*Ordered* to the Senate for concurrence.

The Speaker laid on the table the remonstrance of sundry citizens of Georgetown and its vicinity, in the county of Sussex, remonstrating against the prayer of the petition presented last week, for an amendment to the act authorising a lottery for building an Academy and Masonic Hall in the said town, and for finishing the Episcopal Church therein.

On motion of Mr. Clements,  
The said remonstrance was read, and

On motion of Mr. Marshall,  
The same was referred to the committee on the said petition.

Mr. Betts presented the petition of 352 citizens of New Castle county, praying for a revision of the criminal code, and for the establishment of a penitentiary.

On motion of Mr. Betts,  
The said petition was read and referred to the committee raised on that part of the late Governor's Message which relates to that subject.

Mr. Higgins, chairman of the committee to whom was referred that part of the late Governor's Message which relates to the revision of the criminal code, and the establishment of a penitentiary system,

Moved,  
That two additional members be added to said committee.

Which motion

*Prevailed.*

And Messrs. Huffington and Betts were added to said committee.

Mr. Clements presented the petition of sundry citizens of Kent county, praying the passage of some law for the better regulation of colored hirelings, and for the security and protection of their employers against breaches of contract by such hirelings.

On motion of Mr. Clements,

The said petition was read and referred to Messrs. Clements, Higgins and Hill, with leave to report by bill or otherwise.

Mr. Betts presented the memorial of 330 citizens of New Castle county, praying the Legislature to pass a law to prohibit the drawing of lotteries and the sale of lottery tickets within this State.

On his motion,

The said petition was read and referred to Messrs. Betts, Jefferson and Virden, with leave to report by bill or otherwise.

On motion of Mr. Huffington,

The bill entitled "An act for the relief of Esther Coverdill," was read a second time.

Mr. Johnson presented the petition of Nathan Fleming of Kent county, praying the Legislature to pass a law to enable him to locate certain vacant land therein mentioned.

On motion of Mr. Johnson,

The said petition was read and referred to a committee of three members with leave to report by bill or otherwise.

That committee consists of Messrs. Johnson, Higgins and Jefferson.

On motion of Mr. Huffington,

The House then adjourned until 3 o'clock this afternoon.



*Eodem Die, 3 o'clock P. M.*

The House convened pursuant to adjournment.

Mr. Huffington moved,

That the eighth rule of the House be suspended, in order that he might introduce a bill.

Which motion

*Prevailed.*

He then asked, and

On motion of Mr. Higgins,  
Obtained leave to introduce a bill entitled "An act for the relief of Alexander Johnson" which,

On his motion,  
Was read.

Mr. Dale, chairman of the committee to whom was referred that portion of the late Governor's Message which relates to the ineligibility of Presidents of the United States to more than one term, made the following report, which,

On his motion,  
Was read to wit:—

The committee to whom was referred so much of the Governor's Message as relates to amendments to the constitution, so as to restrict the eligibility of the President of the United States to a single term, recommend the adoption of the foregoing resolutions:—

*Resolved by the Senate and House of Representatives of the State of Delaware in General Assembly met,* That the Senators in Congress from this State be instructed, and our Representative in Congress requested, to use their best efforts to procure such amendments to the Constitution of the United States, as will restrict the eligibility of the President of the United States to a single term.

*Resolved,* That the Governor be requested to forward a copy of the foregoing resolution to each of our Senators and to our Representative in Congress; also to the Executive of each State of the Union, that the same may be laid before their respective Legislatures for their co-operation in procuring said amendment.

On motion of Mr. Clements,  
The said report and resolutions

*Were adopted.*

*Ordered* to the Senate for concurrence.

Mr. Higgins, chairman of the committee of enrolment, reported the following bills and resolutions as being duly and correctly enrolled, and presented the same to the Speaker for his signature, to wit:—

"An act to enable Josiah Carey to locate certain vacant land situate in Baltimore hundred, Sussex county, and to complete his title to the same."

Also "An act to enable James Scott to locate certain vacant land situate in Broad Creek hundred, in Sussex county, and to complete his title to the same."

Also, "An additional supplement to the act entitled 'An act to extend the time for recording of deeds.'"

Also, "A report and joint resolutions on the subject of the public lands."

Also, "A joint resolution for the appointment of an Auditor of Accounts."

And "A joint resolution for the appointment of a State Treasurer."

Mr. Betts presented the petition of sundry citizens of New Castle county, praying the passage of a law for the abolishment of imprisonment for debt.

On motion of Mr. Betts,

The said petition was read and referred to the committee already raised on that subject.

On motion of Mr. Huffington,

The bill entitled "An act to amend the act entitled 'An act concerning the keeping of the papers belonging to the Executive department, and the acts of the General Assembly, and the printing and disposal of the laws and journals,'" was read a second time.

Mr. Marshall presented the petition and certain affidavits accompanying the same, of Mary Griffith, of Sussex county, praying the Legislature to divorce her from her husband, Samuel Griffith.

On his motion,

The same were read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Marshall, Wilds and Betts.

Mr. Collins presented the petition of Samuel Paisley and others of Kent county, praying the Legislature to pass a law to enable them to repair the causeway over Swan creek, in said county, and to erect a gate thereon.

On his motion.

The said petition was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Collins, Dale and Hill.

On motion of Mr. Huffington,

The bill entitled "An act to amend the act entitled 'An act for ascertaining the salaries of the Governor, the Chancellor, the Judges and the Secretary, and for making allowances to the members of the General Assembly and for other purposes, and also to amend the act entitled 'An act to carry into effect the amended constitution and for other purposes,'" was taken up for consideration.

On his motion,

The said bill was then referred to Messrs. Huffington, Higgins and Jefferson, with a view to amendment.

On motion of Mr. Dale,

The bill entitled "An act to amend the supplement passed January 25th, 1830, to the act for the establishment of free schools," was taken up for consideration.

Mr. Dale then moved,

That the said bill be referred to a committee of three members with a view to amendment.

Which motion

*Prevailed.*

And Messrs. Dale, Clements and Hill, were appointed.

Mr. Betts presented a memorial from Willard Hall and Henry Gibbons, on behalf of the Temperance Beneficial Society of Wilmington, praying the Legislature for an act of incorporation.

On motion of Mr. Betts,

The said petition was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Betts, Frazer and Marshall.

Mr. Marshall presented the memorial of John P. Paynter and others, commissioners, praying the Legislature to appropriate the sum of five hundred dollars, to complete the repairs on the bridge over Broadkilk creek at Paynter's Landing.

On motion of Mr. Marshall,

The said memorial was read and referred to a committee of three members, with leave to report by bill or otherwise.

That committee consists of Messrs. Marshall, Higgins and Johnson.

Mr. Wilds presented the petition of sundry citizens of Kent county, praying the Legislature to extend the jurisdiction of Justices of the Peace to sums not exceeding one hundred dollars.

On motion of Mr. Wilds,

The said petition was read and referred to the committee already raised on that subject.

Mr. Huffington presented the petition of Joseph L. Harper, late Auditor of Accounts, praying the appointment of a joint committee to make settlement with him for repairs done on the Auditor's office, &c.

Mr. Huffington moved,

That the said petition be referred to a committee of three members, with leave to report by resolution or otherwise.

Which motion

*Prevailed.*

And Messrs. Huffington, Dale and Jefferson, were appointed that committee.

On motion of Mr. Huffington,

The bill entitled "An act to repeal the act entitled 'An additional supplement to the act entitled An act providing for the punishment of certain crimes and misdemeanors,'" was read a third time by paragraphs and

*Passed the House.*

*Ordered* to the Senate for concurrence.

On motion of Mr. Jefferson,  
The House then adjourned until to-morrow morning at 10 o'clock.



THURSDAY, 10 o'clock, A. M., January 28, 1841.

The House met pursuant to adjournment.

Mr. Fisher, Clerk of the Senate, being admitted, presented for the concurrence of the House, a certain preamble and joint resolutions in favor of the repeal of the sub-treasury law, and establishment of a National Bank.

And he at the same time presented for the signature of the Speaker of the House of Representatives, sundry enrolled bills.

And he withdrew.

On motion of Mr. Barr,  
The said preamble and resolutions were read as follow, to wit:—

“IN SENATE, *January 27, 1841.*

*Resolved by the Senate and House of Representatives of the State of Delaware in General Assembly met,* That it is the constitutional duty of Congress to regulate the currency of the nation, and that experience has fully shown, that without the aid of a National Bank that duty cannot be discharged.

*Resolved,* That a National Bank is indispensably necessary to the proper management of the fiscal concerns of the nation; that the act of Congress commonly called the sub-treasury, or independent treasury act, is a departure from the line of policy adopted by Washington and Madison, and the other founders of the government, is at war with the whole spirit of our republican institutions, is odious, as establishing an unjust discrimination between the officers of the government and the people, and until repealed, must continue to distract the exchanges, disorder the currency, and prostrate the industry of the country.

*Resolved,* That our Senators in Congress be instructed, and our Representative requested, to use their best efforts to procure a repeal of the sub-treasury act, to establish a National Bank on the basis approved by Washington and Madison, and to bring back the government of the nation from the path of experiment to the principles of the fathers of the republic.

*Extract from the Journal.*

G. P. FISHER, *Clerk.*

*For concurrence.”*

Mr. Huffington moved,  
That the eighth rule of the House be suspended, in order that he might introduce a bill.

Which motion

*Prevailed.*

Mr. Huffington then asked, and

On motion of Mr. Higgins,  
Obtained leave to introduce a bill entitled "A supplement to the act entitled 'An act concerning awards, to regulate the summoning and returning of juries, and for lessening the expense thereof, and for other purposes.'"

On motion of Mr. Huffington,  
The said bill was read, and

On his motion,  
One hundred copies thereof were ordered to be printed.

Mr. Dale presented the petition of Sally Morris of Sussex county, praying the Legislature to make her compensation to the amount of nine hundred dollars, for the services of her deceased father, rendered long since, as one of the commissioners of taxes, which

On his motion,  
Was read.

Mr. Dale then moved,  
That the said petition be referred to the committee of claims.

Which motion

*Was lost.*

On motion of Mr. Clements,  
*Ordered,* That Sally Morris have leave to withdraw her said petition.

Mr. Clements presented the claim against the State of Joseph Buckmaster, for taking care of the State Library, taking care of the furniture of the House of Representatives since the last session, and fitting up said chamber at the commencement of the present session.

On motion of Mr. Clements,  
The said claim was read and referred to the committee on claims.

Mr. Huffington laid on the table the following joint resolution, which

On his motion,  
Was read and adopted, viz:—

*Resolved by the Senate and House of Representatives of the State of Delaware in General Assembly met,* That the Secretary of State be, and he is hereby authorised and requested to transmit to the Librarian of Congress, to be placed in the congressional library, the sixth, seventh and eighth volumes of the Delaware laws.

The Speaker laid on the table a communication from the Hon. Samuel M. Harrington, which

On motion of Mr. Huffington,  
Was read, as follows, viz:—

*To the Honorable the Senate  
and House of Representatives:*

In obedience to an act of the General Assembly entitled "An act to secure a report of cases adjudged in this State," passed Feb. 22, 1837, the subscriber has the honor to report to the Legislature:

That he has prepared for publication a second volume of Reports of cases argued and adjudged in the Superior Court, Court of Oyer and Terminer, and Court of Errors and Appeals, on such points as he considered important to be known and understood by the people of this State. This volume embraces the decisions from June Term, 1835, to the Fall Sessions, 1839, with references to many of the older cases, and will make a book of 600 closely printed pages. The volume has been printed, and is in the hands of the binder, and will be ready for delivery before the end of the session.

The State subscribed for 100 copies of the 1st volume of these reports which was necessary to save the publisher from loss, the edition being so small as to require a sale of nearly the whole to defray expenses. These copies were distributed by law to certain public officers in the State; and one copy was sent to the Executive of each State and Territory of the United States; in return for which we have received from many of those States and territories three copies of similar Reports of their judicial decisions, thus bringing within our reach the adjudged cases as well as the statute laws of the several States of this Union, and forming the basis of a useful State library. It is believed also, that the principles of our jurisprudence and the character of our judicial tribunals, have been made more generally (it is hoped more favorably) known beyond the limits of our own State, through the medium of these Reports, than could have been done by any other means. In reference to their usefulness at home, scarcely any one who has been in the habit of attending the sessions of our courts can have failed to observe the time saved, the litigation suppressed, and the uniformity and certainty of decision produced by this record of previous decisions. But there is one means of their usefulness originally contemplated by the Legislature that has not been fully realised. It appears, from the report of the committee on whose recommendation these Reports were commenced (House Journal 1835, p. 151.) that they considered "if a copy were furnished to each Justice of the Peace in the State, to be retained in his office and transmitted to his successor, it would perhaps be the means of making such a work more immediately useful to the public than any other that could be devised." On this suggestion the subscriber has taken pains to report certiorari cases in such manner as to point out to this inferior, but very important tribunal, the defects in its mode of proceeding, and the causes of the reversal of its judgments. In some instances he has furnished forms of entry, and precedents for such legal documents as indentures of apprenticeship and other papers in